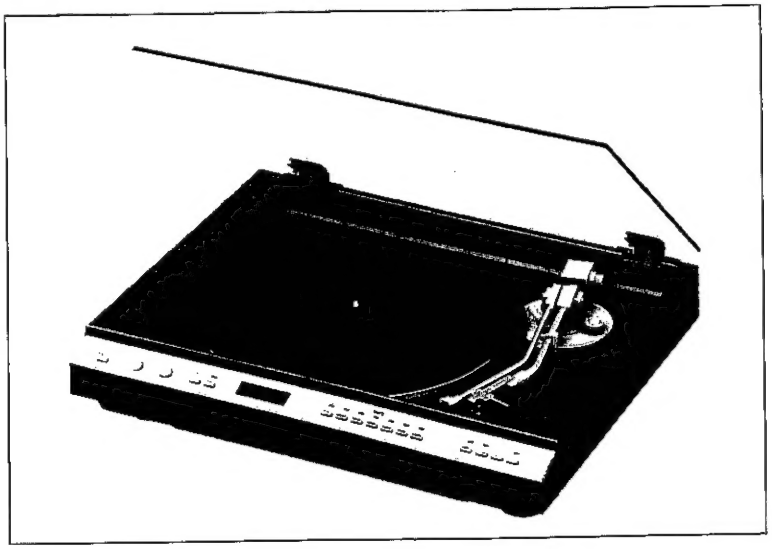
SHARP OPTONICA

SERVICE MANUAL

RP-7100H
RP-7100HB



STEREO TURNTABLE

MODEL
RP-7100H
(Silver Panel)
RP-7100HB
(Brown Panel)

In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used.

INDEX TO CONTENTS

SHARP CORPORATION OSAKA, JAPAN

SPECIFICATIONS

Power source:	AC 110/220/240V, 50/60 Hz
Power consumption:	10W
Semiconductors:	22-IC 47-transistor 33-diode 2-hall elements 1 quartz-crystal oscillator
Dimensions: (with dust cover)	Width: 480 mm (18-29/32") Height: 108 mm (4-1/4") Depth: 384 mm (15-1/8")
Weight:	9 kg (20 lbs)

TURNTABLE

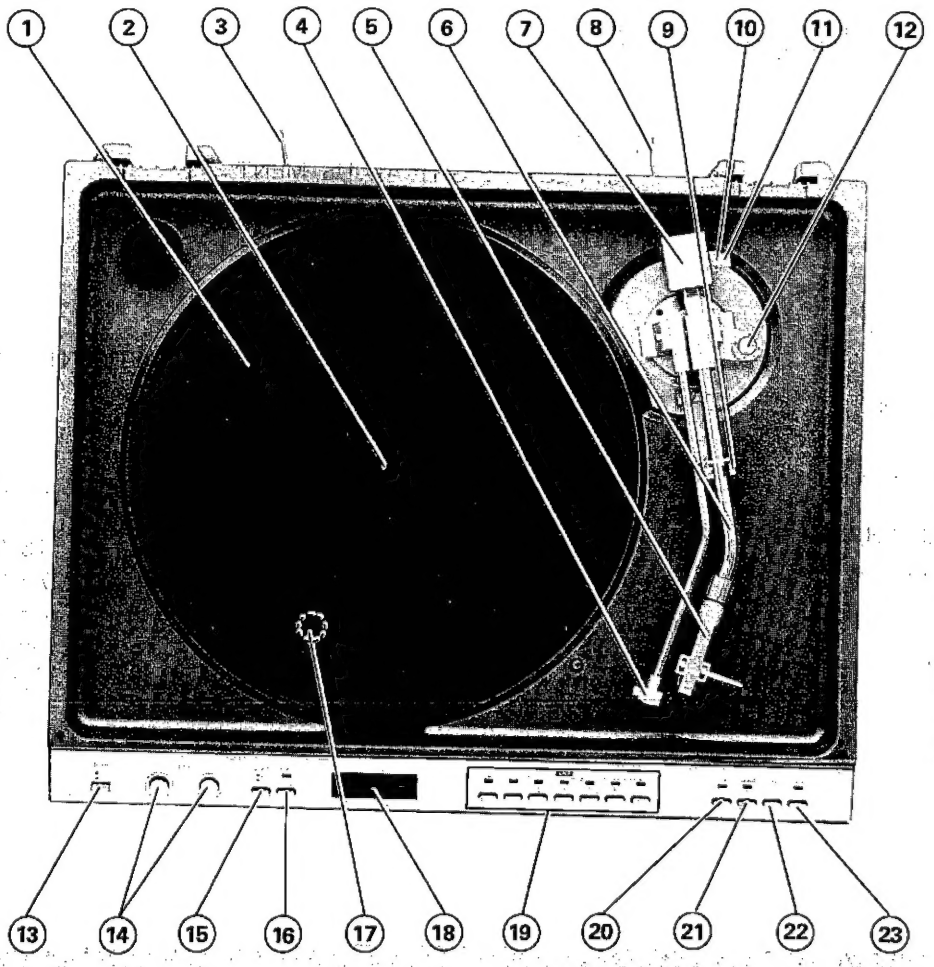
Motor:	Core-less DC servo mono-torque motor
Speed stabilization:	160-pole frequency generator, PLL with quartz-crystal oscillator, sample hold phase detector.
Drive system:	Direct-drive
Speed:	33-1/3 and 45 rpm
Speed control range:	Within ±4%
Wow & Flutter:	±0.045% (DIN 45 507)
Rumble:	Better than 68 dB (DIN-B)
Turntable platter:	30 cm (12 in.) aluminum die-cast with stroboscope marks.

TONEARM

Type:	Statically balanced pipe arm with APLD sensor.
Effective length:	210 mm (18-1/4")
Overhang:	11 mm (7/16")
Off-set angle:	19°
Cartridge weight range:	4 to 12 grams

Specifications are subject to change without prior notice.

DESIGNATION OF PARTS



1. Turntable Platter
2. Center Spindle
3. AC Supply Cord
4. APLD Sensor
5. Headshell
6. Tonearm
7. Counterweight
8. Output Leads
9. Tonearm Rest
10. Tracking Force Gauge
11. Tracking Force Adjustment Knob
12. Anti-skating Control
13. Power Switch
14. Pitch Control
15. Speed Selector
16. Quarts-crystal PLL on/off
17. Voltage Selector
18. Stroboscope
19. APLD Number Buttons and Indicators
20. Cueing Control Button
21. Repeat Play Button
22. Cut Out Button
23. Play Start Button

Figure 1

DISASSEMBLY

Disconnect all leads connected to the back of the unit.
Remove fourteen (14) screws retaining the bottom plate.

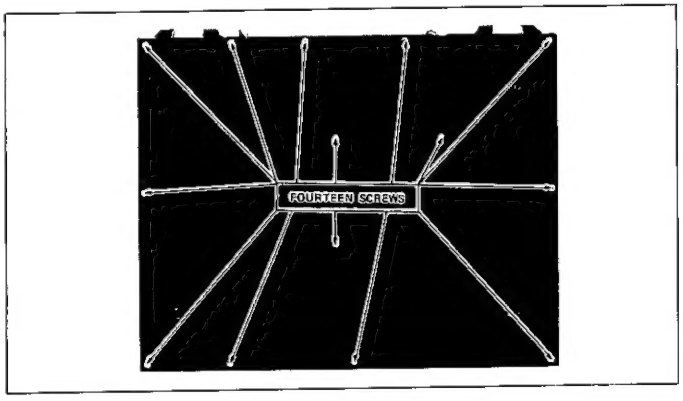


Figure 2

VOLTAGE SELECTION

Check the preset AC supply voltage before plugging the AC supply cord into an AC wall outlet. If the setting is different from your local supply voltage, the voltage selector (located on the base board, under the turntable platter) must be reset as follows:
Rotate the voltage selector switch with a screwdriver, so that your local voltage number can be seen in the window.
Note:
Since this unit uses DD motor, operation is regardless of whether the frequency of AC supply is 50 Hz or 60 Hz.

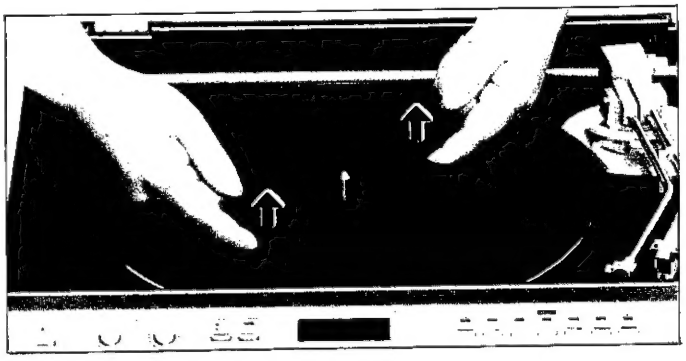


Figure 3

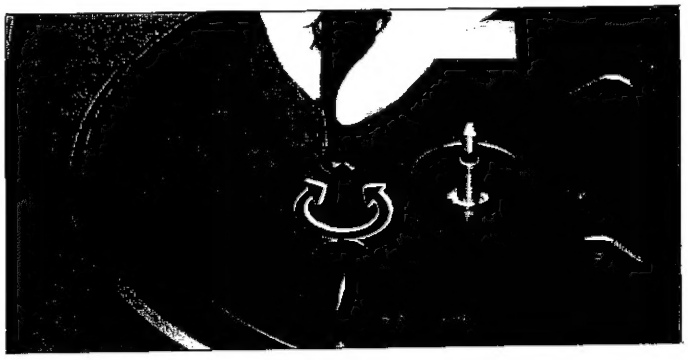


Figure 4

TONEARM LIFTER

When operating the turntable after it has been stored for long periods, tonearm may not move in initial action because of the property of oil.
In this case, move the tonearm lifter 2 to 3 times up and down with your fingers. The lifter will be able to function normally.

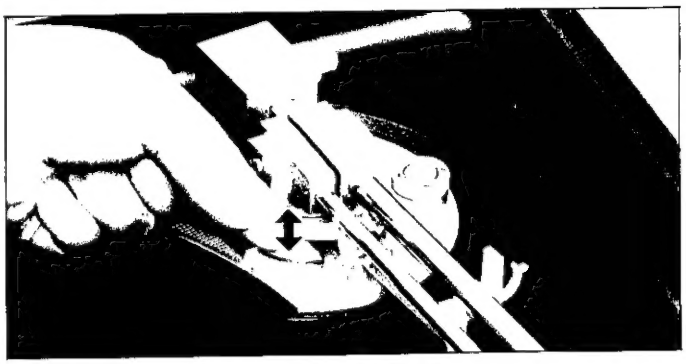


Figure 5

CARTRIDGE MOUNTING

A cartridge is not furnished with the unit.

Important Note:

* Any cartridge of which the dimension "A" shown in figure 7 is greater than 19 mm, cannot be applied to this set.
* The weight of the cartridge should be 4 to 12 grams.

1. Before attempting to mount the cartridge read the instructions supplied by the cartridge manufacturer. The cartridge you have selected may require some special mounting hardware or need to be insulated from the headshell. The cartridge can be mounted to the headshell with the hardware supplied by the cartridge manufacturer or with the hardware included with the turntable.
2. The headshell has been pre-wired to facilitate connection to the cartridge. Attach the wires to the cartridge by sliding the connector over the proper terminal on the cartridge.
3. The cartridge must be positioned in the headshell so that there is a distance of 50 mm between the tip of the stylus and the rubber grommet at the plug end of the headshell. Without this adjustment the APLD won't function normally.

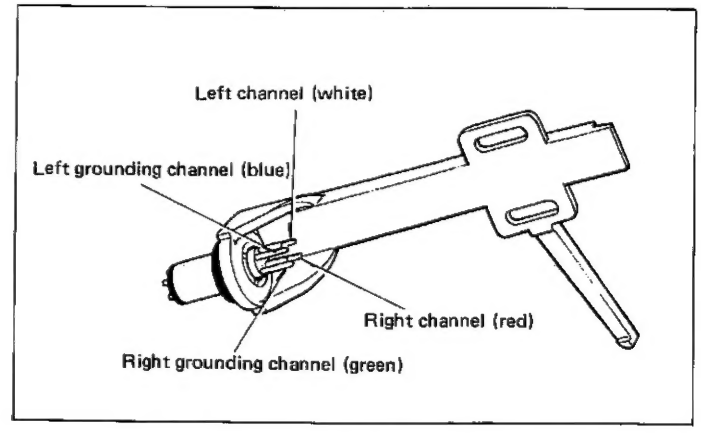


Figure 6

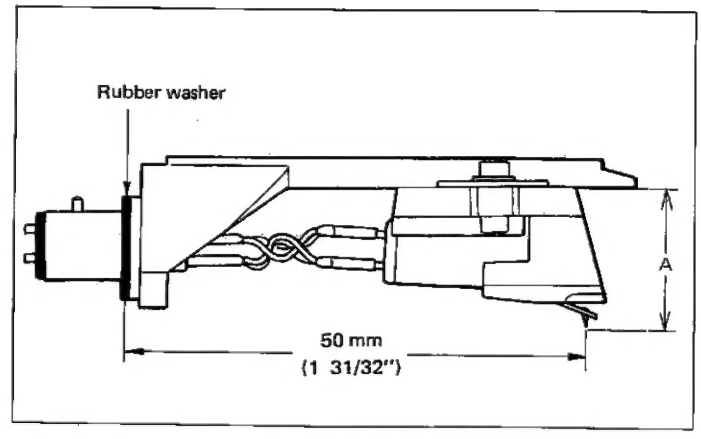


Figure 7

DUST COVER MOUNTING

Join the plate hinges and hinge brackets on the cabinet with a downward motion as indicated by the arrow in the illustration.

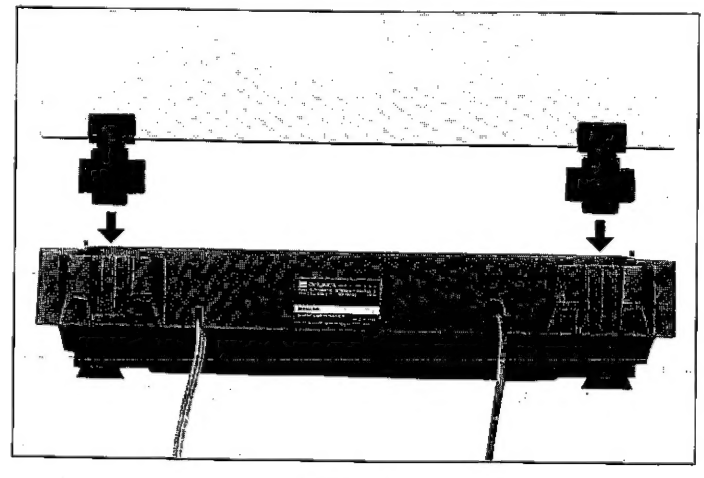


Figure 8

TRACKING FORCE ADJUSTMENT

1. Adjust the antiskating control to the "0" position (See Figure 9).
2. Move the tonearm to over the platter surface. The tonearm must be supported with your hand to prevent the stylus from hitting the motor board or the platter (See Figure 10).
3. Rotate the tracking force adjustment knob till perfect balance is achieved. When the tonearm is perfectly balanced it will keep its horizontal position when you remove your hand (See Figure 11).
4. Replace the tonearm on the rest with your hand (See Figure 12).
5. Rotate the tracking force gauge with your fingers till "0" graduation aligns with a mark on the counterweight (See Figure 13).
6. Consult the cartridge instructions to find the tracking force recommended by the cartridge manufacturer.
   Rotate the tracking force adjustment knob in the direction of the arrow as shown in the figure 14, till the disired force aligns to a mark on the counterweight.
7. Adjust the anti-skating control to the same number as the tracking force that you have chosen in the above step 6 (See Figure 15).

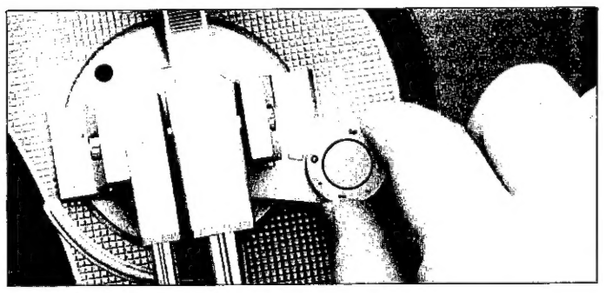


Figure 9

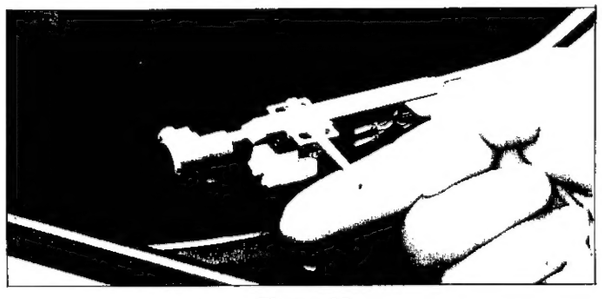


Figure 10

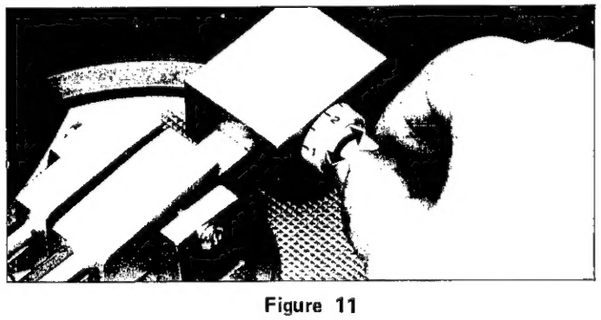


Figure 11

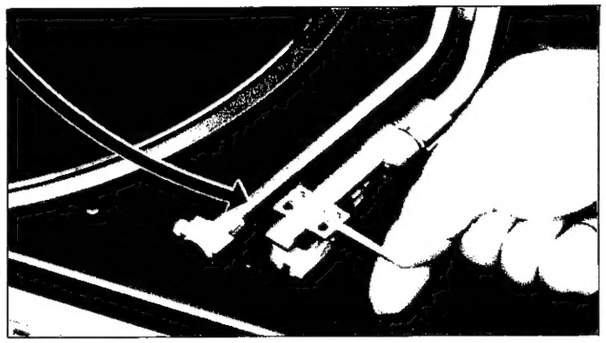


Figure 12

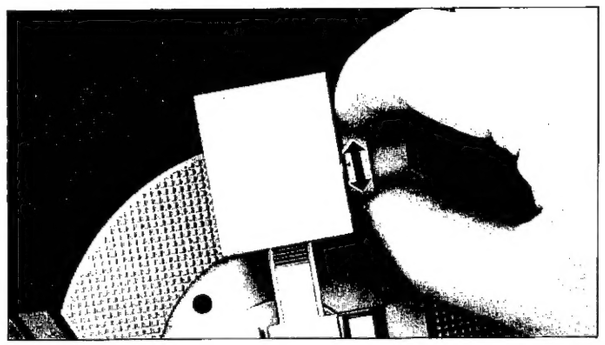


Figure 13

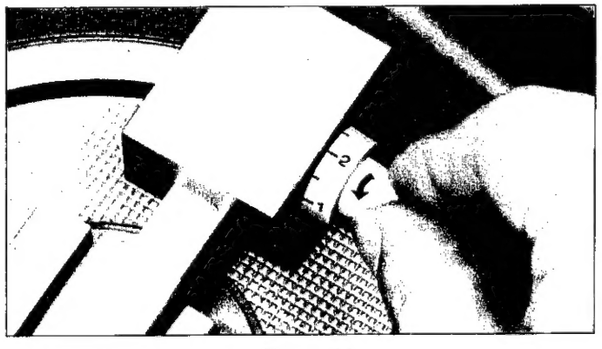


Figure 14

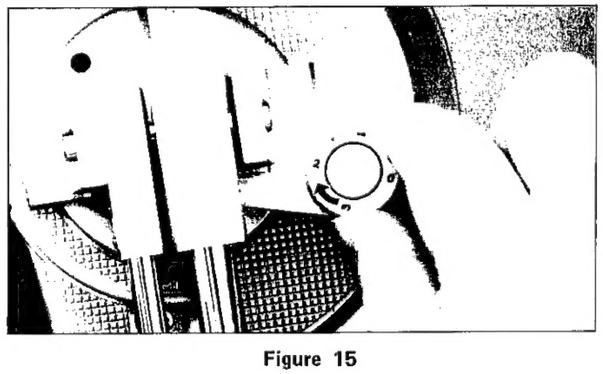


Figure 15

ADJUSTMENT OF AUTOMATIC LEAD-IN MECHANISM

If the stylus, APLD sensor and tonearm bearing are not positionally arranged at the same center line, this results in both the APLD and autoplay-start mechanism working abnormally. This is proved by the fact that the APLD cannot search for the desired program's spaces in a normal way. In this case, take the following procedures to solve the problem.

1. Keep two discs in hand, a 30 cm (12") and 17 cm (7") one.
2. After adjusting the tracking force of cartridge, plug the AC supply cord into a wall outlet, then set the power switch to "on" position.
3. Place a 30 cm (12") disc on the rubber mat of turntable.
4. Press the "play" button. The tonearm will leave the rest and descend on the disc.
5. If the stylus descends outside the disc periphery, rotate the screw (as shown in the illustration) anticlockwise. While, if it descends inside the starting groove of the disc, rotate the screw clockwise.
6. Next, place a 17 cm (7") disc, instead of the 30 cm (12") one, on the platter and do the same as above.

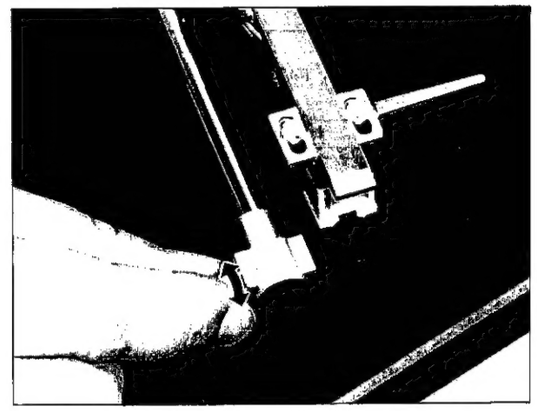


Figure 16

CLEANING THE STYLUS TIP

To clean the stylus use a soft brush (not supplied).
Wipe it in the direction of arrow shown in the illustration.
Never touch the stylus with your fingers, or the stylus tip may break.

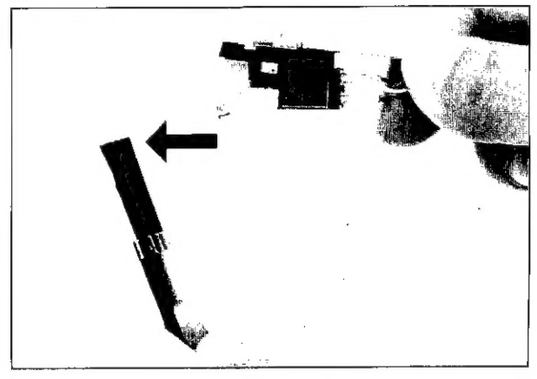


Figure 17

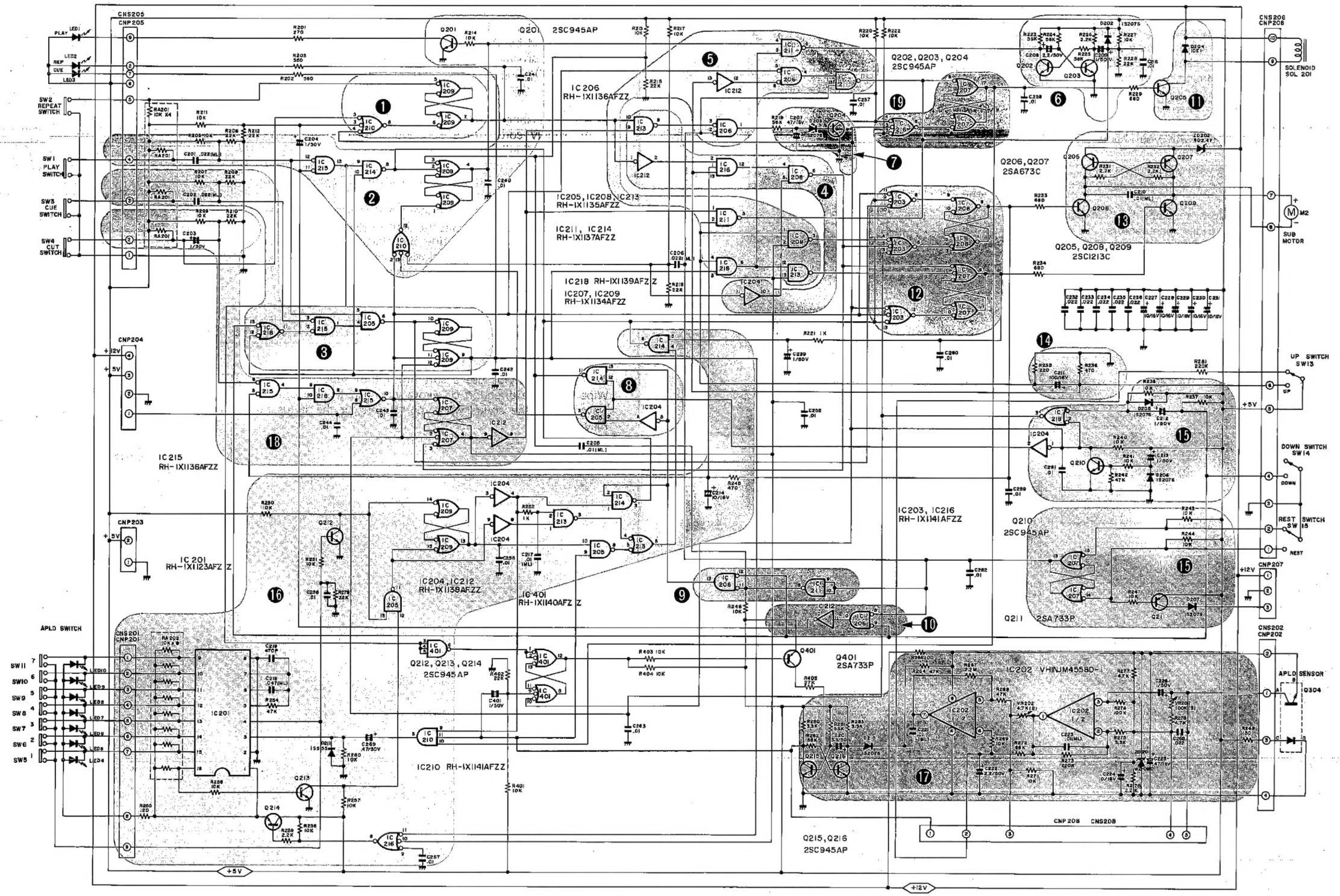


Figure 18 SCHEMATIC DIAGRAM OF LOGIC CIRCUIT

■ OUTLINE

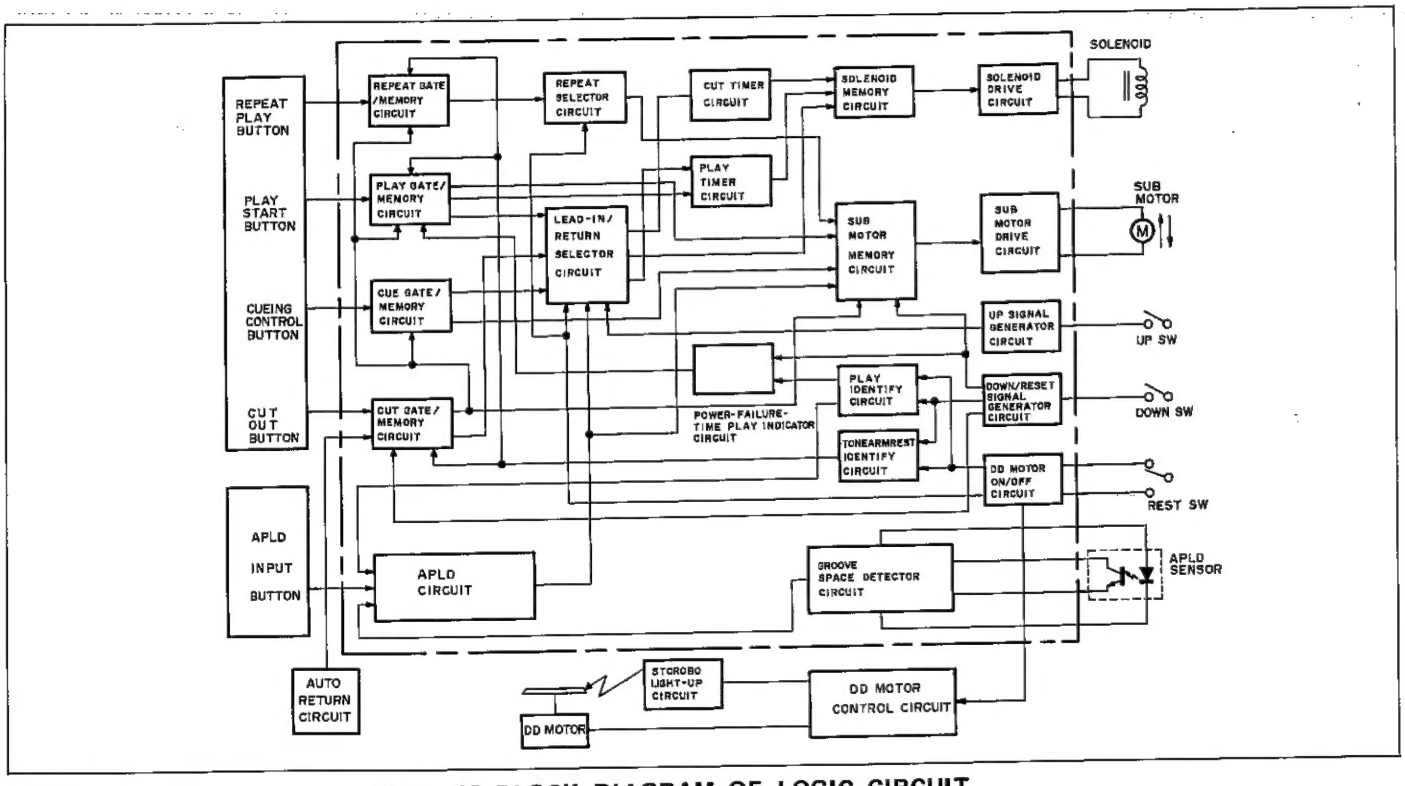


Figure 19 BLOCK DIAGRAM OF LOGIC CIRCUIT

❶ REPEAT GATE/MEMORY CIRCUIT
Circuit which memorizes the unit is put in the repeat mode, and sends forth the signal to the repeat selector circuit. The signal is also used to turn the repeat indicator LED (LED2) on.

❷ PLAY GATE/MEMORY CIRCUIT
Does not permit the unit to accept the play signal except when the tonearm is settled on its rest. This circuit also memorizes the unit is put in the play mode, and feeds the signal to the lead-in/return selector circuit. The signal is also used to turn the play indicator LED (LED1) on.

❸ CUE GATE/MEMORY CIRCUIT
Does not let the unit accept the cue signal except while the cuing operation is performed.
This circuit also memorizes the unit is put in the cue mode, and sends the signal to the lead-in/return selector circuit. The signal is also used to turn the cue indicator LED (LED3) on.

❹ REPEAT SELECTOR CIRCUIT
Circuit which leads in the tonearm when it returns to its tonearm rest.

❺ LEAD-IN/RETURN SELECTOR CIRCUIT
Selects which mode the unit is to be put in, among the lead-in, return and cue modes.

❻ PLAY TIMER CIRCUIT
In the case of leading in, when the tonearm is lifted up there is required an interval during which the sub motor changes its rotational direction from the normal to the reverse; for that reason, this circuit works to delay an attraction of the solenoid by 90msec.

❼ CUT TIMER CIRCUIT
When the tonearm returns to its tonearmrest, this circuit delays putting in the solenoid in action by 0.9 sec, even if the rest switch (SW15) is open (off).

❽ POWER-FAILURE-TIME PLAY INDICATOR CIRCUIT
Turns the play indicator LED (LED1) on when power failes or tempararily becomes off during playing.

❾ PLAY IDENTIFY CIRCUIT
Identifies the unit is playing.

❿ TONEARM REST IDENTIFY CIRCUIT
Identifies the tonearm is on its tonearm rest. The circuit also generates the signal for putting the play and repeat indicators off when the tonearm is manually put back to its tonearmrest.

⓫ SOLENOID DRIVE CIRCUIT
Drives the solenoid in response to the solenoid actuating signal.

⓬ SUB MOTOR MEMORY CIRCUIT
Memorizes the motor actuating signal specifying the normal or reverse direction rotation, and keeps it till the normal or reverse rotation stop signal is received.

⓭ SUB MOTOR DRIVE CIRCUIT
Drives the motor.

⓮ UP SIGNAL GENERATOR CIRCUIT
Circuit which generates the up signal of tonearm rest.

⑮ DOWN-RESET SIGNAL GENERATOR CIRCUIT

Comprises the following circuits:

(1) Circuit which generates the up and reset signals.
(2) Rest switch (SW15) chattering prevention circuit and DD motor on/off circuit.
(3) Circuit which generates the down and reset signals. motor when the tonearm is on its rest; and it generates the signal which actuates the DD motor when the tonearm leves its rest.

⑯ APLD CIRCUIT

Puts the APLD (Auto Program Locate Device) in action.

⑰ GROOVE SPACE DETECTOR CIRCUIT

Detects a program void groove between programs.

⑱ CUT GATE/MEMORY CIRCUIT

Let the unit accept the motor actuating signal the normal or tonearm is settled on it rest.
This circuit also memorizes the unit is put in the cut mode, and sends the signal to the lead-in/return selector circuit.

⑲ SOLENOID MEMORY CIRCUIT

Memorizes the solenoid actuating signal and keep it till the solenoid stop signal received.

GROOVE SPACE DETECTOR CIRCUIT

GROOVE SPACE DETECTOR CIRCUIT

(1) Program-to-program space detector
By the difference in reflection factor of infrared rays between no-sound-groove and sound-groove, this detector detects spaces between programs; when the sensor arm reaches a no-sound-groove the collector voltage of the APLD SENSOR Q304 becomes as shown by the waveform Ⓐ. The longer the no-sound-groove is, the wider this waveform width becomes.

(2) Output amplifier circuit
The waveform Ⓐ is here amplified in terms of A.C. so that the waveform Ⓑ is obtained.

(3) Waveform shaping circuit
Shapes the waveform Ⓑ into a square wave; the result is as shown by the waveform Ⓒ.

(4) Groove pulse generator circuit
Differentiates Ⓓ, the waveform Ⓒ once, and generates the program-to-program pulse with constant width. The pulse takes on a waveform as shown by Ⓔ.

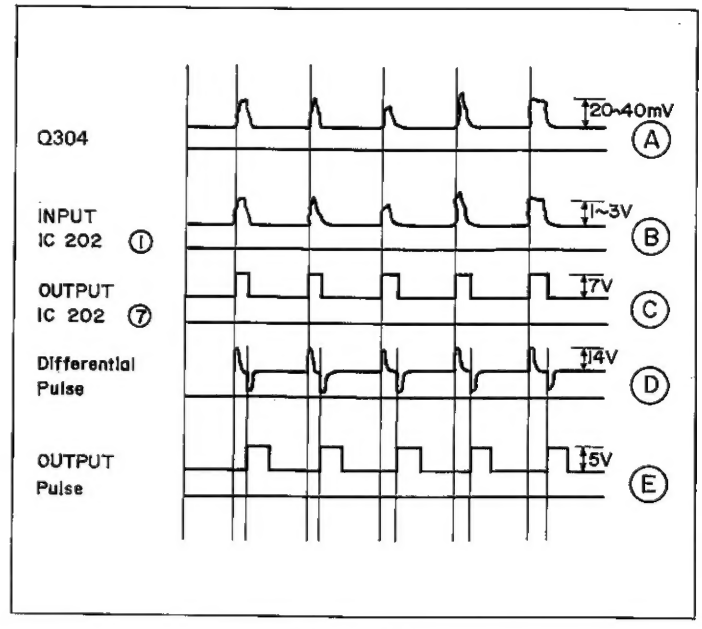


Figure 20

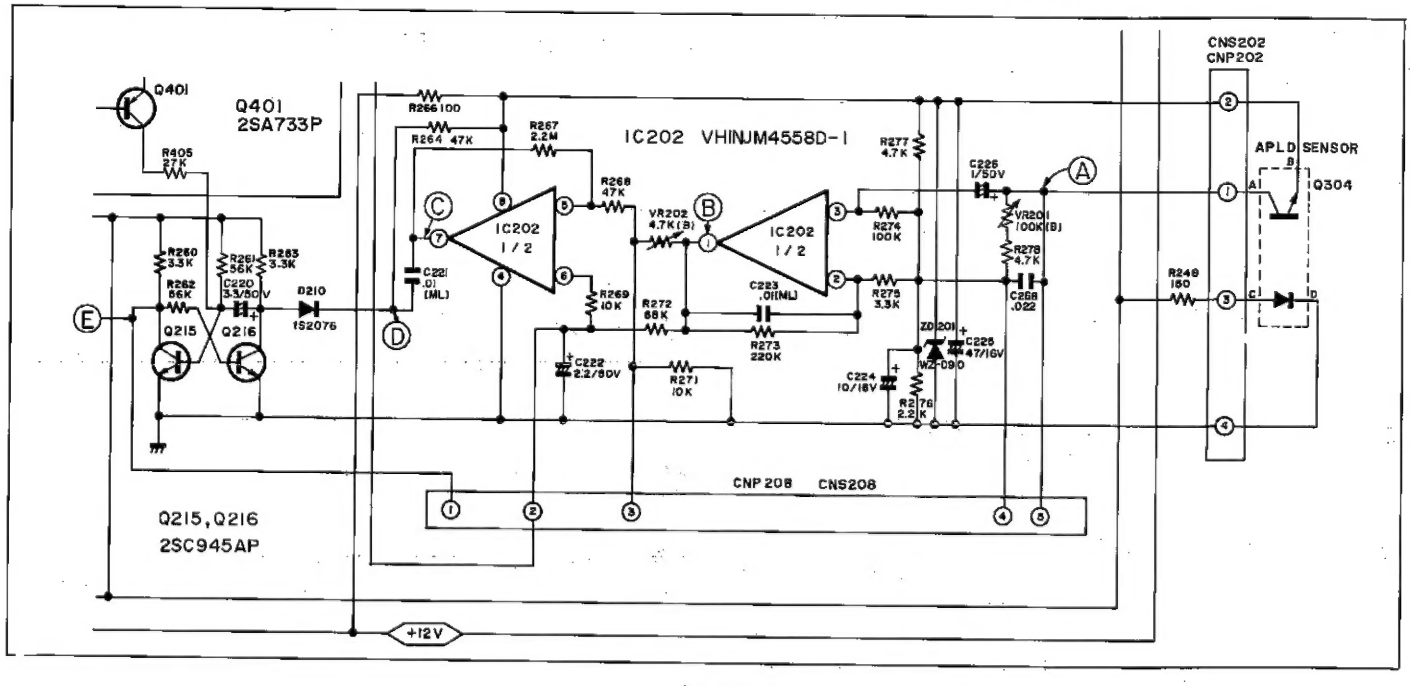


Figure 21

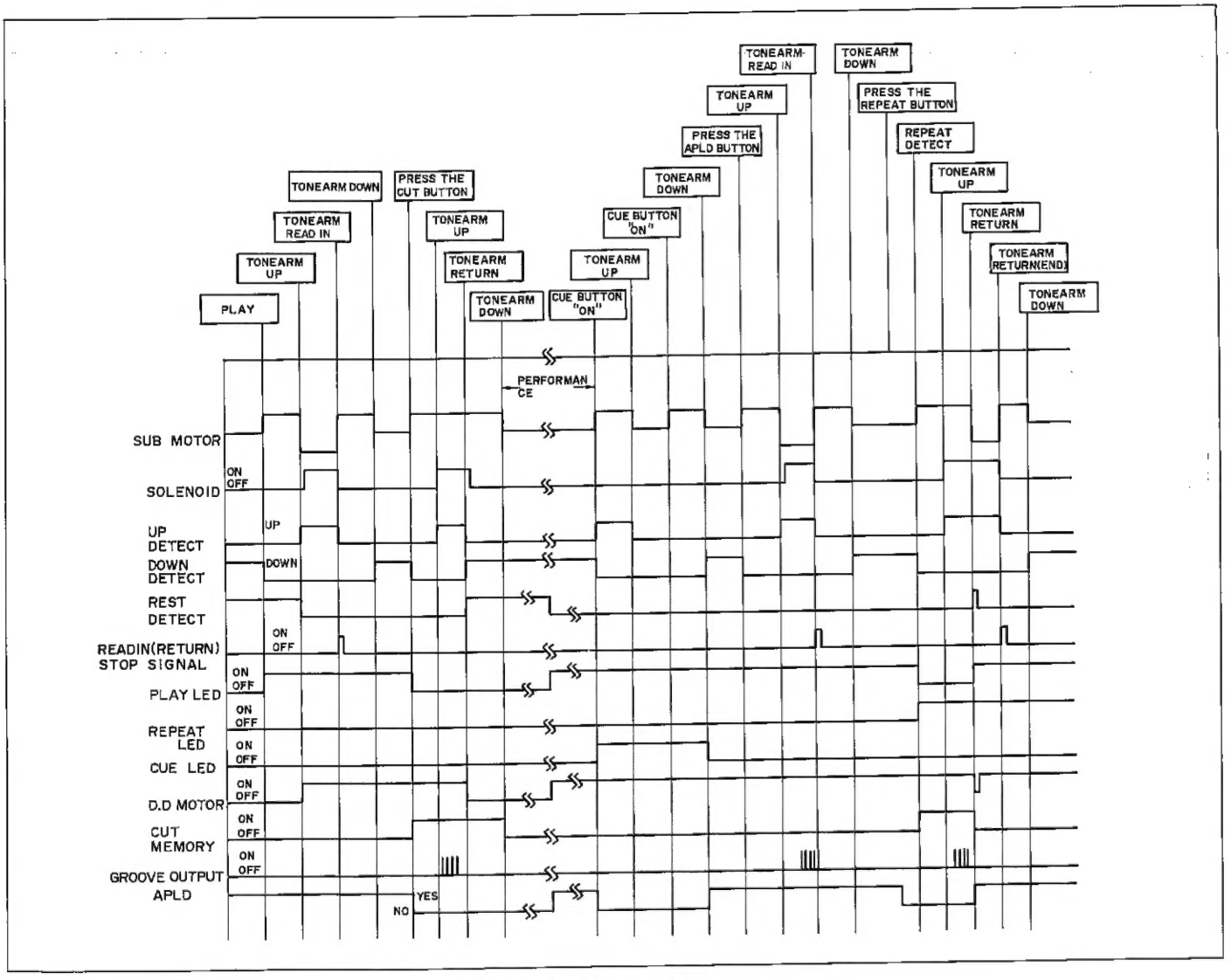


Figure 22 TIME CHART

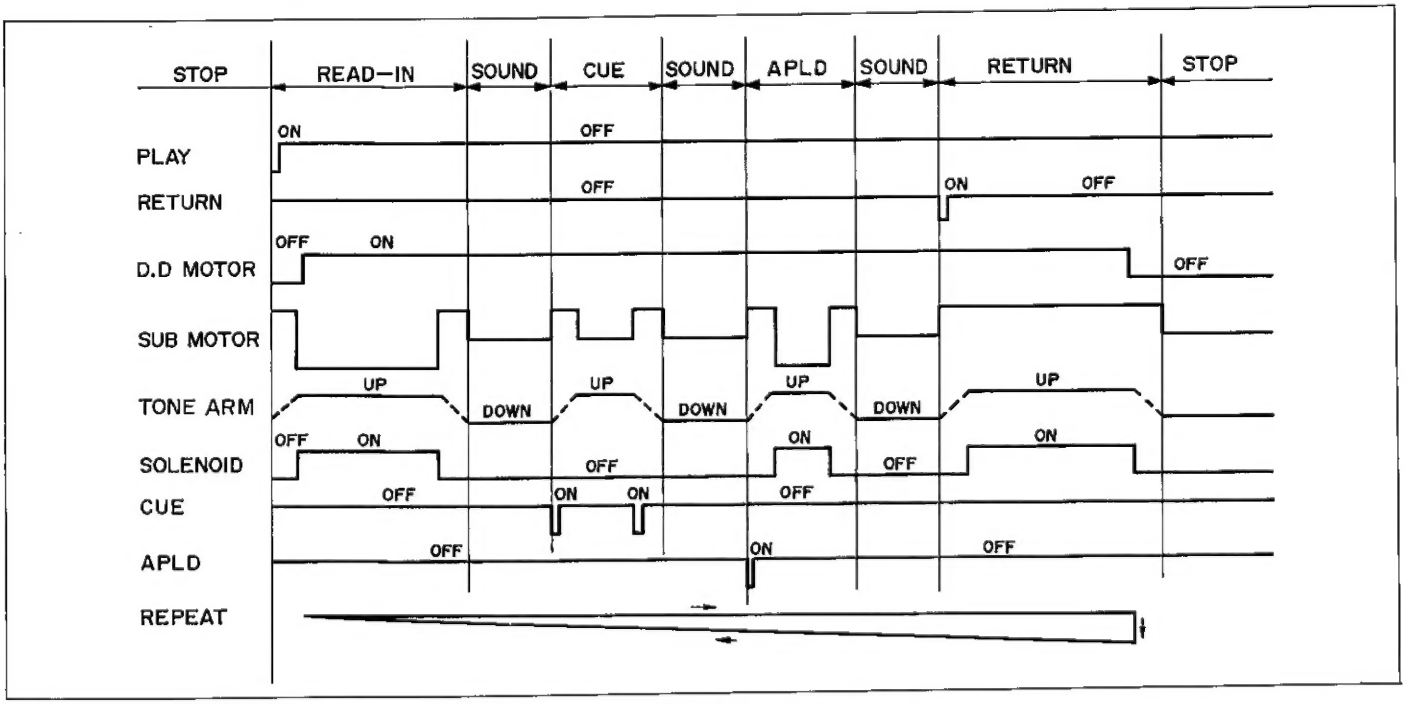


Figure 23 TIME MODE CHART

BEHAVIORS OF LOGIC CIRCUIT (See Figure 24)

① When the play start button is depressed with the power switch SW12 set at "on", the play indicator LED (LED1) lights up, and the tonearm moves away its rest, then it ascends. --- at the time, the sub-motor is rotating in clockwise direction. When the tonearm reaches its "up" position thoroughly, the sub motor now changes its rotating direction: say, it rotates in counterclockwise direction to get action of the solenoid, so that the tonearm will slide towards the surface of a record.
A signal flow corresponding to the abovementioned is revealed in Section ① of the separate Signal Flow Chart. In Section ① of the Chart, the non-shaded zone shows a signal flow up to the process where the tonearm "up" motion stops: while the shaded zone up to the process where the tonearm begins to slide towards the record surface.
In the following descriptions ② thru ⑩, it is preferred for you to refer to this Chart now and then for better understanding.

② As the tonearm slides towards the record surface, the APLD sensor Q304 finds out the 1st groove of a record (or the pre-designated groove in the case of APLD operation), and with this, the sub motor changes the rotation from counterclockwise to clockwise direction and simultaneously the solenoid stops to function. As a result, the tonearm begins to descend onto the record, the sub motor stops to rotate, and the unit gets in play mode. The abovementioned is illustrated in Section ② of the Chart. The non-shaded zone shows a signal flow up to the process where the solenoid stops to function while the shaded zone, the process thereafter.
The term "APLD" in the Chart means the process where the unit is under APLD operation.

③ When the cueing control button is pushed during play mode, signals are caused, as shown in the non-shaded zone in Section ③ of the Chart, so as to have the cue indicator LED (LED3) light up and also to let the sub motor change the rotation from counterclockwise to clockwise direction --- with this, the tonearm comes off the record surface and it will ascend to the full extent. Next, signals are caused as shown in the shaded zone of the Chart, to stop the rotation of the sub motor eventually.

④ If the cueing control button is pushed once again, signals are caused as shown in the non-shaded zone in Section ④ of the Chart, to have the sub motor rotate in clockwise direction, then the tonearm will thus descend onto the record surface. Next, signals are caused as shown in the shaded zone of the Chart, to stop the rotation of the sub motor with the cue indicator LED (LED3) going off.

⑤ When a play is finished (say, the tonearm reaches the end groove of record), or when the cut-out button is pushed during play mode, signals are caused as shown in the non-shaded zone in Section ⑤ of the Chart, resulting in that: the play indicator LED (LED1) is put off; the sub motor rotates in clockwise direction; the tonearm comes off the record surface and ascends. Next, signals are caused as shown in the shaded zone of the Chart, so the solenoid functions and the tonearm comes back to its rest.

⑥ The moment the tonearm reaches its rest, signals are caused as shown in the non-shaded zone in Section ⑥ of the Chart, so the solenoid stops to function and the tonearm enters the inside of its rest. Next, signals are caused as shown in the shaded zone, to stop the rotation of the sub motor and to reset the memory (of play mode).

⑦ If the cueing control button is pushed when the tonearm is inside its rest, the tonearm comes off its rest and ascends. In this state, if the cut-out button is further pushed, signal are caused as shown in the non-shaded zone in Section ⑦ of the Chart, so the sub motor rotates in clockwise direction to have the tonearm again descend onto its rest. Thereafter, sginals are caused as shown in the shaded zone of the Chart, resulting in that the sub motor stops to rotate and the memory (of play mode) is reset.

⑧ If the play start button is pushed when the tonearm is inside its rest, the play start LED lights up, and the tonearm comes off its rest and ascend while moving towards the record surface. Under this state, if the cut-out button is further pushed, signals are caused as shown in the non-shaded zone in Section ⑧ of the Chart, so the sub motor changes the rotation from counterclockwise to clockwise direction, the play start LED is put off and the tonearm comes back to its rest. Thereafter, signals are caused as shown in the shaded zone of the Chart, resulting in that the solenoid stops to function, the tonearm enters the inside of its rest and the sub motor stops to rotate.

⑨ Pushing the repeat play button will enable the unit to perform auto-return operation of the tonearm. Here is shown what the auto-return operation is referring to Section ⑨ of the Chart.
If the repeat play button is pushed, signals are caused as shown in the non-shaded zone in Section ⑨ of the Chart, so the repeat indicator LED (LED2) lights up and the repeat signal is memorized in the unit: with this, it is in play mode that when the tonearm reaches the end groove of record, it, in turn, comes back automatically to its rest. Thereafter, signals are caused as shown in the shaded zone of the Chart, resulting in that the sub motor changes the rotation from clockwise to counterclockwise direction and the unit again starts play from the beginning.

⑩ If any one of the APLD number buttons (1 to 7) is pushed during play mode, signals are caused as shown in Section ⑩ of the Chart, so the sub motor rotates in clockwise direction, and the tonearm comes off the record surface and ascends. Thereafter, signals are caused as shown in the shaded zone and as a result, the sub motor changes the rotation from clockwise to counterclockwise direction and the solenoid functions. With the solenoid operation, the tonearm shifts above a record to find out a program-to-program space (groove) of it --- now, the sub motor keeps the counterclockwise rotation. Next with such groove detected, signals are caused as shown in the non shaded zone in Section ⑪ of the Chart, resulting in that the sub motor changes the rotation from counterclockwise to clockwise direction, the solenoid stops to function and the tonearm finally descends onto the detected groove. Thereafter, signals are caused in the shaded zone of the Chart, so the sub motor stops to rotate and the unit starts to play.

SIGNAL FLOW CHART

Figure 24

■ BEHAVIORS OF CONTROL CIRCUIT

The control circuit consists of a frequency generator servo circuit and sync circuit; the frequency generator servo circuit produces the signal according the speeds of the turntable which rotates coaxially with the motor, and the sync circuit provides a phase control with a quartz oscillator signal as a reference.
Described below are details of each part with the block diagram referred.

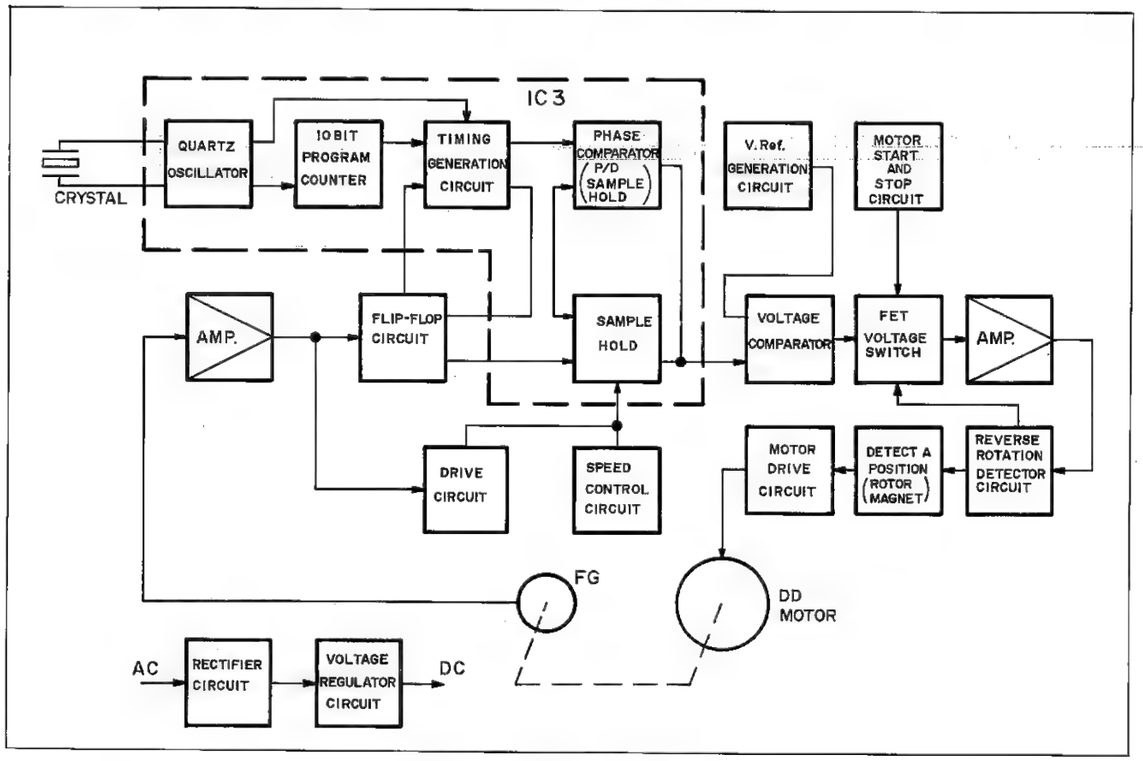


Figure 25 BLACK DIAGRAM

(1) Frequency generator, amplifier and flip-flop circuit

The frequency generator comprises a 160-pole magnet, a multigap head having 80-pair-pole teeth and coils. The frequency generator produces the 44.44 Hz sine-wave signal when playing the LP (33-1/3 rpm) record, and the 60 Hz sine-wave signal in the case of the EP (45 rpm) record; the signal is amplified by the operational amplifier IC1 (1/2) and the 24 V peak-to-peak waveform (A) is obtained; then the waveform (A) is sent to the flip-flop circuit so that the rectangular waveform of 50% duty cycle is obtained.

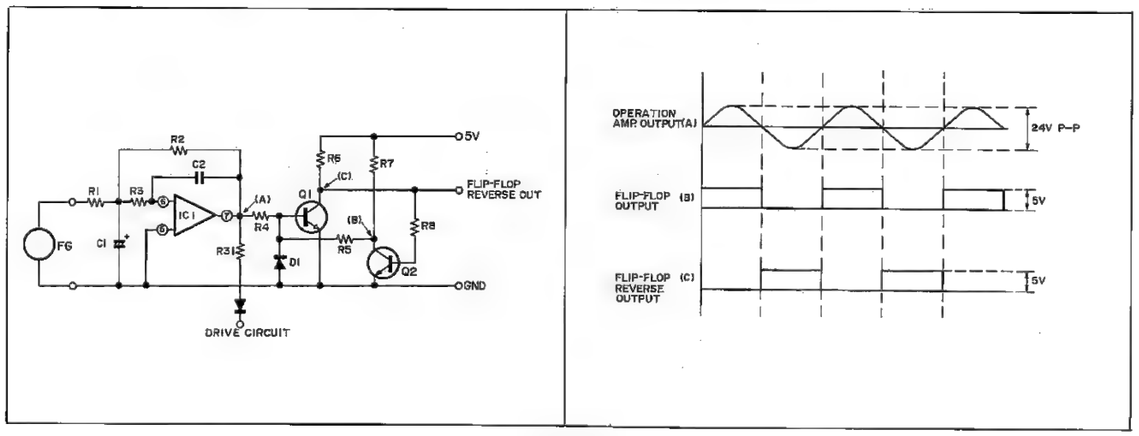


Figure 26

(2) Operation control timing generator circuit and F/V sample hold circuit

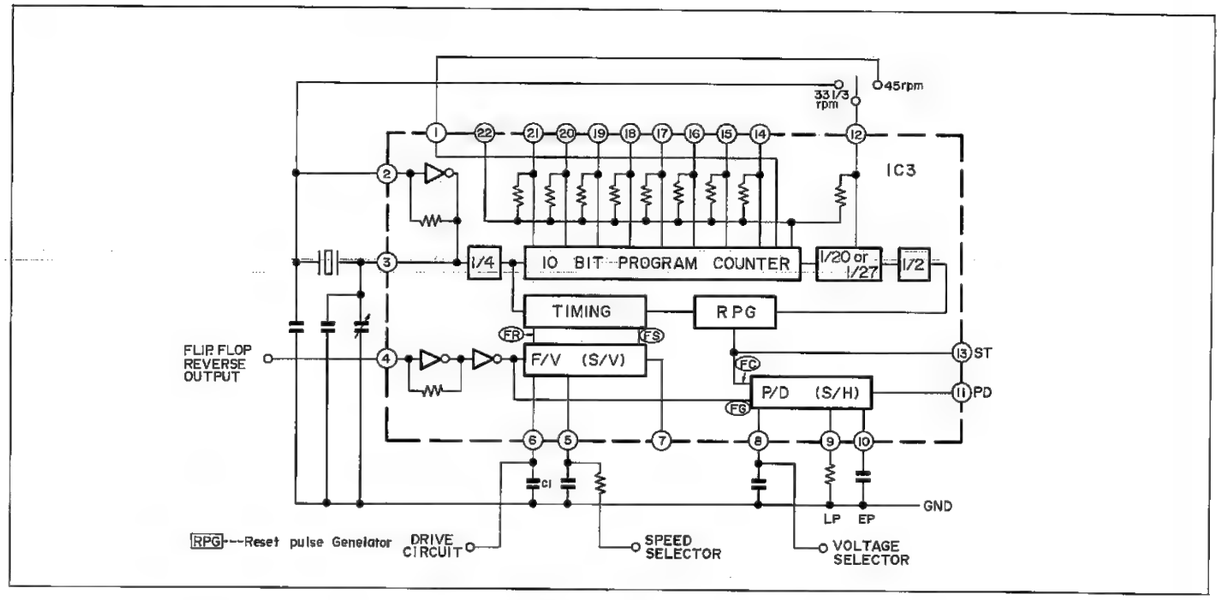


Figure 27 BLACK DIAGRAM OF PLL IC (IC3)

The timing generator circuit is actuated by a pulse gained by dividing the quartz oscillator frequency to quarter.
When the starting part of the frequency generator's (FG) flip-flop reaction output enters the (FV) sample hold circuit, it is held by means of the sample pulse of the timing generator circuit so that the hold output voltage (FV) is obtained.
Thereafter, the reset pulse (FR) from the timing generator circuit discharges the load from C1, and the saw tooth wave (FVS) is obtained.

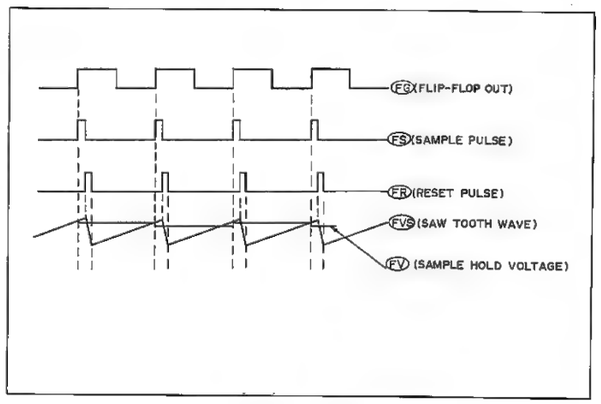


Figure 28 SIGNAL FLOW CHART

(3) Quartz oscillator and 10-bit program counter

This is a C-MOS inverter oscillator and the oscillation frequency can be adjusted by using the trimmer capacitor VC1 which is connected in parallel with the load of the quartz.

Quartz is of 9.3312 MHz type.
The programing is so designed that the frequency is divided by 972 for both LP and EP records to be played.

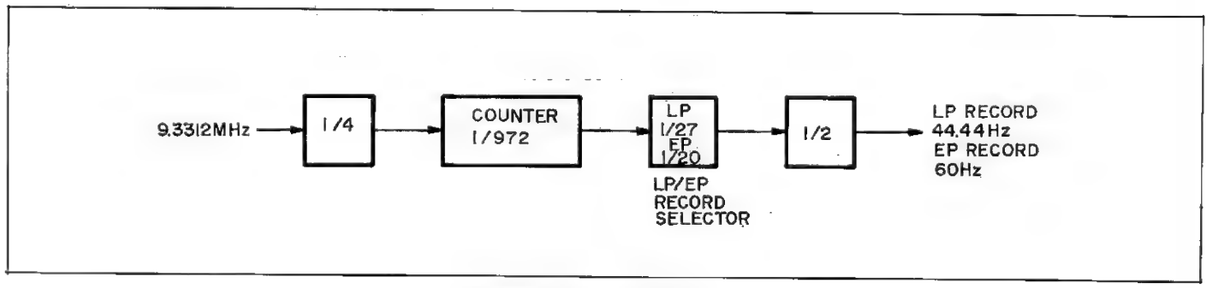


Figure 29 FREQUENCY DIVIDER

(4) Phase comparator circuit (P/D sample hold)

By the strobo signal output pulse, this circuit generates the saw tooth wave.

Besides, the circuit is appended with a bootstrap circuit so that the resultant saw tooth wave will have an excellent linearity.

This saw tooth wave is sample-hold by the flip-flop (FG) inversion of frequency generator.

Moreover, the phase comparator circuit is designed to be kept off by a switch when the quartz lock is off.

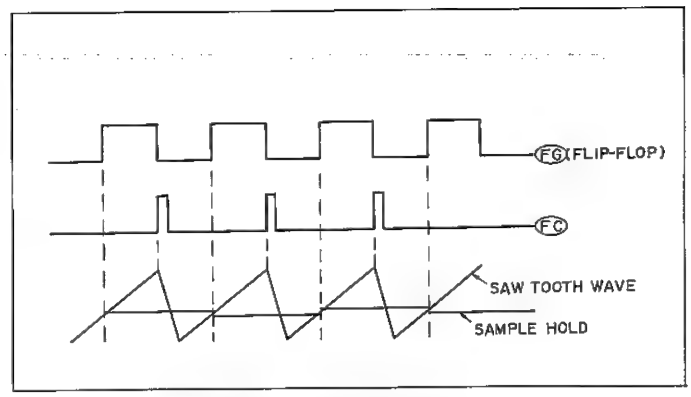


Figure 30 PHASE COMPARATOR

(5) Strobo signal output circuit

At pin (12) of IC3 this circuit, the output from the frequency divider circuit is more divided by 27 in the case of the LP record, and by 20 in the case of the EP one; then it is divided further by 2. And the reset pulse generator takes a timing pulse out of it to create a strobo signal.

- This timing pulse is also used as a reference signal for the P/D sample hold circuit.

(6) Reference voltage circuit (Voltage comparator)

Circuit which sets rpm of the DD motor; the constant voltage for it is obtained by making the output of the constant voltage circuit subject to a resistance-type voltage division.

This circuit compares the added output of the phase comparator and (FV) sample hold circuit with the reference voltage.

(7) Reversing rotation detector circuit (FET voltage switch) (See Figure 50)

When the output from the voltage comparator becomes below 0 V (in the case of reversing rotation), the transistor at the lower side of this circuit is turned off.

At that time, the voltage at the source-to-gate junction of the FET (Q3) becomes lower than the pinch-off voltage, and the resistance at its drain-to-source junction becomes higher so that the signal stops being fed to the Hall element (HE). Until the capacitor in the gate is charged up, the voltage at the source-to-gate junction is higher than the pinch-off voltage and the reversing rotation brake is therefore applied.

The FET voltage switch puts the FET in conduction or cutoff by means of the motor start or stop signal. It also puts the FET in conduction or cutoff by means of the signal from the reversing rotation detector circuit (in the case of reverse rotation of the motor).

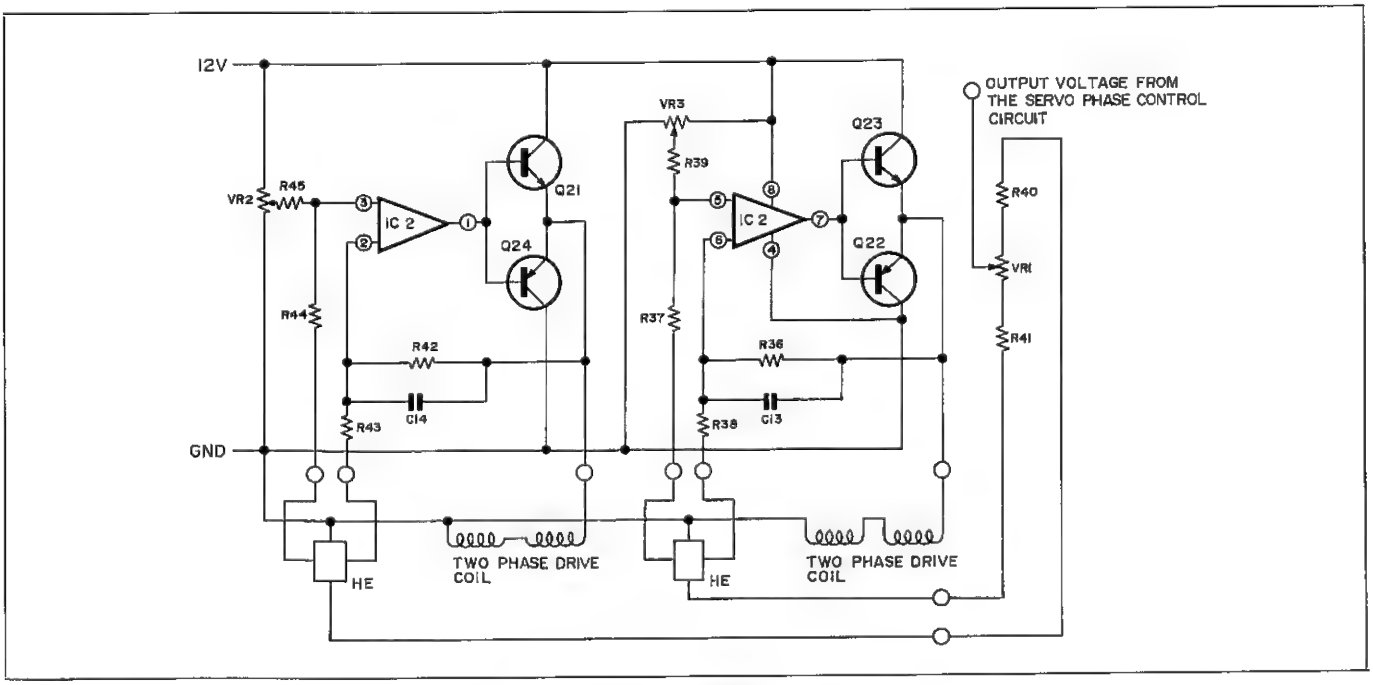


Figure 31 DD MOTOR DRIVE CIRCUIT

(8) DD motor drive circuit (See Figure 31)

This circuit detects a position of the rotor magnet by means of the Hall element (HE) and determines an order of the currents to feed to the two-phase drive coil. Besides, the voltage applied to the Hall element is controlled by the servo phase control circuit; the output voltage from the Hall element is varied according to variation of the rotation phase; then that output voltage is amplified by the operational amplifier IC2 to feed the current into the drive coil.

(9) Rectifier circuit (Constant voltage circuit)

This circuit rectifies the AC input by 4 diodes D11 ~ D14. The voltage by the zener diode ZD1 is 5.6 V; the 5.6 V constant voltage is taken out by the emitter-follower type transistor Q14.

The +12 V voltage is stabilized by the way that: the voltage subjected to a voltage division by the R50, R51 and VR4 is compared with the reference voltage provided by the ZD1, by means of the Q15.

When the +12 V voltage is thus stabilized, base current of the control transistor is governed by the transistor Q18 with the aid of voltage division by R54, R55 and R56 so that −12 V voltage is also stabilized.

The 12 V voltage can be adjusted externally by the variable resistor VR4.

① Allowable range for entry of the APLD Button at the control section.

② Except when the motor rotates in the normal direction.

③ Only during the time of playing.

(10) Tonearm moving speed detector circuit

When the tonearm comes near the end groove of the record, the shutter installed beneath the arm enters between the LED and the photo transistor so that the voltage at the collector of the photo-transistor varies as shown by Ⓐ in the figure. And the voltage Ⓐ runs through C301 and takes on an output waveform as shown by Ⓑ . This voltage increases when the tonearm moving speed becomes faster.

Voltage comparator

Applies the reference voltage Ⓒ to pin ② of IC301 (the operational amplifier), and the voltage Ⓑ to pin ③

Return pulse generator

Divides the output of IC301 by R308 and R303; and the divided output becomes the output pulse Ⓔ.

Reference voltage switch

Since the required output voltage Ⓒ is different between 33 rpm and 45 rpm records, the reference voltage is changed by this switch; in the case of 33 rpm, the transistor Q301 is ON to make VR302 and R315 a parallel connection so that the voltage Ⓒ becomes low.

(11) Storobo light-up circuit

To pin ⑬ of IC3, the 44.44 Hz pulse is fed when playing the LP record, and the 60 Hz pulse when playing the EP record; and this circuit turns on the transistor Q104 by means of the abovementioned pulses to trigger the monostable multivibrator. Q102 of this monostable multivibrator is in conduction and Q103 of it in cut-off in the stable state; but when the trigger pulse is fed into it, Q102 is turned off and Q103, on to light up the LED just during a period which is determined by R104 and C105.

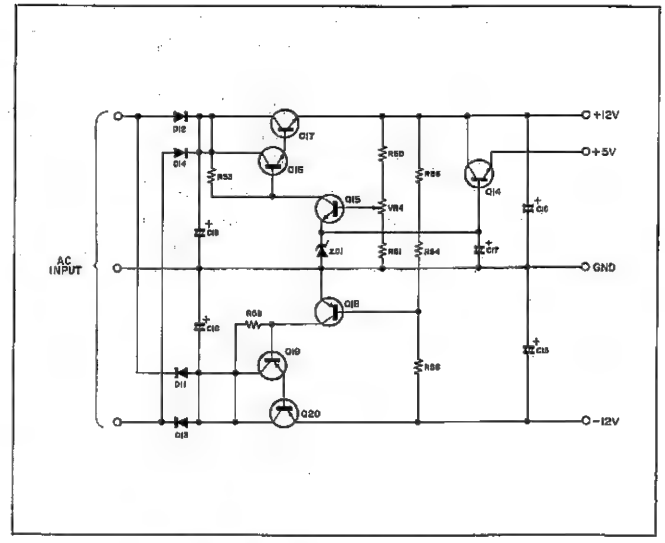


Figure 32 RECTIFIER CIRCUIT

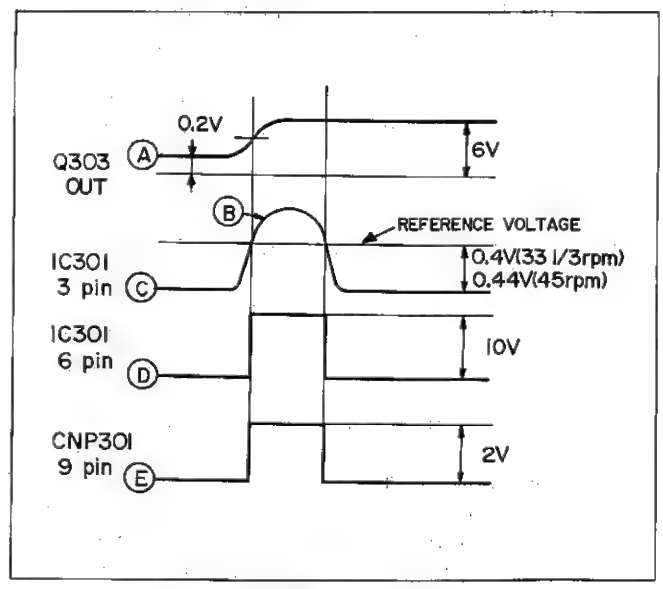


Figure 33 TIME CHART

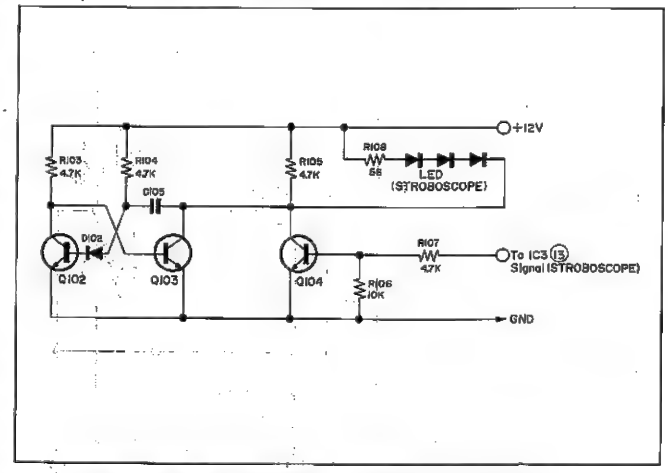
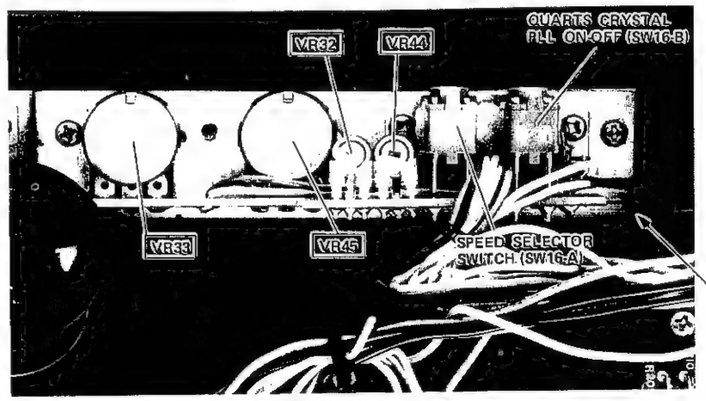
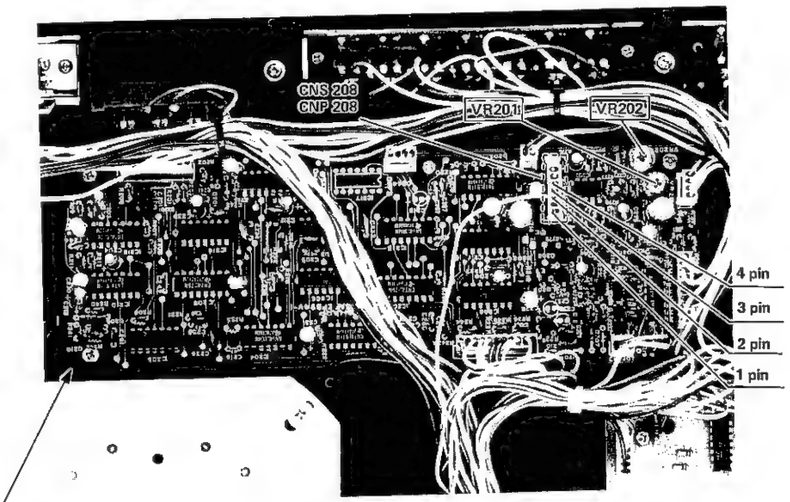


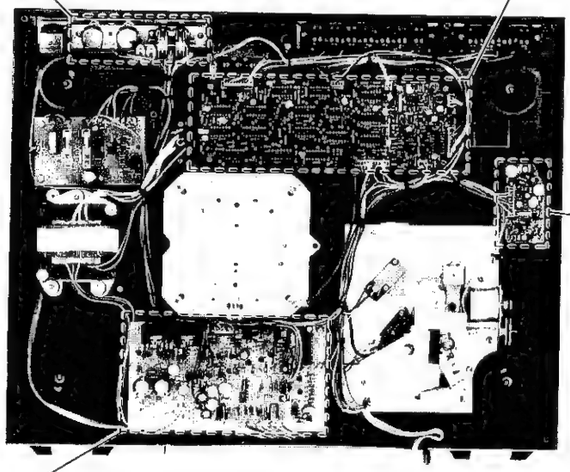
Figure 34 STROBO LIGHT-UP CIRCUIT

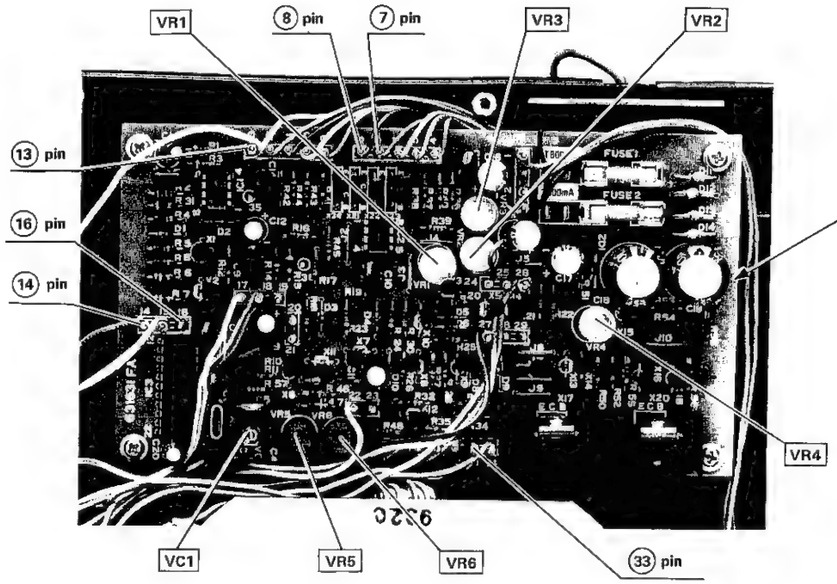


SWITCH P.W.B.

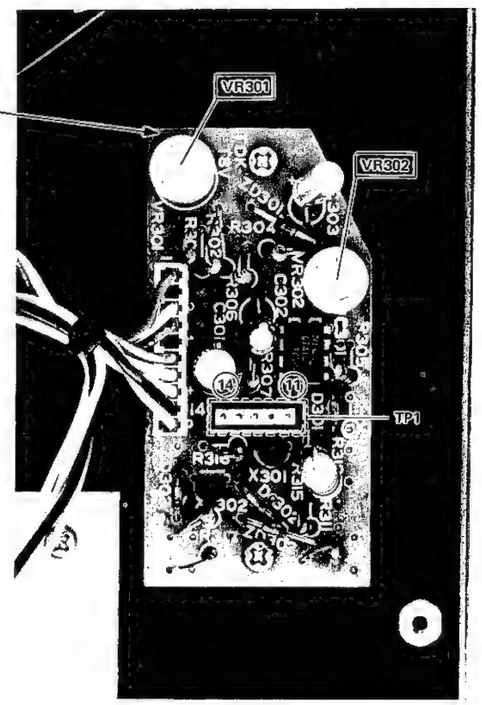


LOGIC P.W.B.





CONTROL P.W.B.



AUTO RETURN P.W.B.

Figure 35

ADJUSTMENT

STYLUS HEIGHT ADJUSTMENT (LEAD-IN HEIGHT)

1. Put the power supply cord of the unit into a wall outlet; Set the power switch in "on" position; then press the cueing control button to send the tonearm up.
2. Manually hold the headshell grip; bring it over the record; then put the tonearm onto the tonearm lifter.
3. Turn the adjustment screw of the tonearm lifter using a screwdriver having a form as shown in the figure in order to adjust the stylus height.

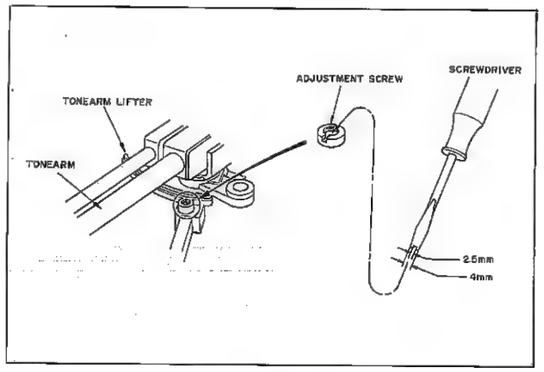


Figure 36

AUTO RETURN ADJUSTMENT

1. Set the speed selector switch to "33 rpm" position.
2. Play the test record (SSR-4001), and adjustment screw so that the return count becomes 14 ± 1.
3. Change the selector switch to "45 rpm" position, and make sure of the proper function.

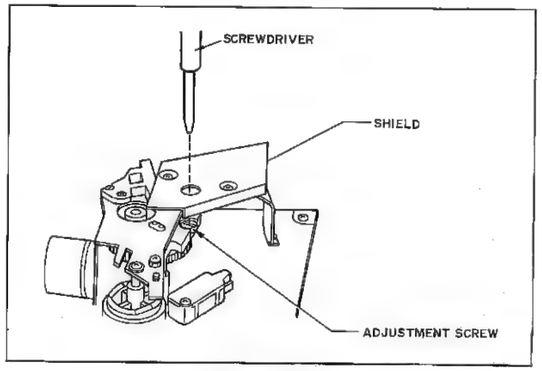


Figure 37

SENSITIVITY ADJUSTMENT

1. Put the test record (TOSHIBA LF1003 or equivalent) on the turntable.
2. Set the power switch to "on" position.
3. Lift up the tonearm by pressing the Cueing control button.
4. Set the power switch to "off" position.
5. Move the headshell on the lead out groove of the test record by finger.
6. In this condition, unplug the connector socket CNS208 from the connector plug CNP208 mounted on the logic P.W.Board.
7. Connect the DC VTVM to the pin terminals of the connector plug CPN208 [Pin 5 (positive), Pin 4 (negative)], and adjust the variable resistor VR201 so that the VTVM reads 30 mV (30 ± 2 mV).
8. Next, set the tonearm on the tonearm rest.
9. Change the connection of the DC VTVM to the pin terminals of the connector plug CPN208 [Pin 2 (positive), Pin 3 (negative)], and adjust the variable resistor VR202 so that the DC VTVM reads 0.2V (0.2 ± 0.01V).

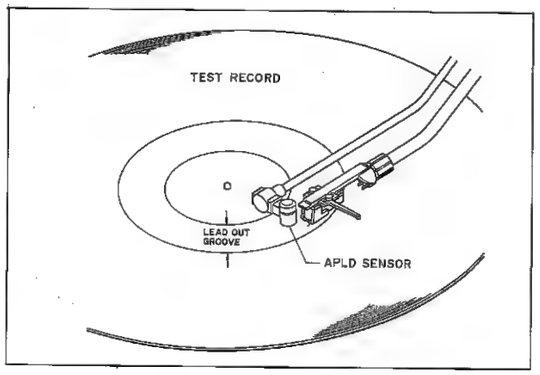


Figure 38

CHECKING OF THE APLD SENSOR HEIGHT

Check the hight and horizontal of the APLD sensor against the record surface on the turntable.

1. Set the power switch to "on", press the cueing control button, move the headshell over the record, and set the power switch to "off".
2. Make sure the height of sensor bottom from the record surface to be with-in 4.5 ± 1 mm, and at the same time to be parallel with record surface.
3. If, not correct, loosen the two screws fixing the sensor arm pipe at it's root, and modify the hight and horizontal of the sensor by rotating the sensor arm pipe. Never forget the screws fixing.

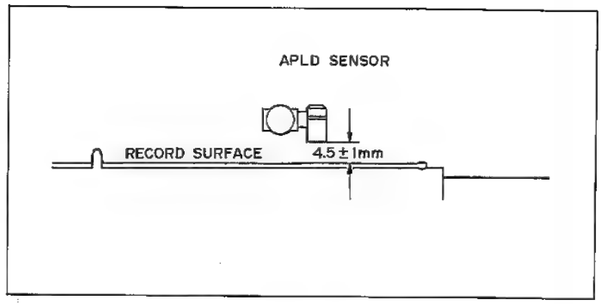


Figure 39

QUARTZ LOCK TIMING ADJUSTMENT

1. Connect one end of a dual-beam synchroscope, on the control PWB, between pin (33) (GND) and pin (14) and another between pin (33) (GND) and pin (16).
2. Setting the speed selector at "33 rpm" position, adjust the variable resistor VR5 so that strobo signal pulse and frequency generator's signal pulse will be shown in Figure 40.
3. Next with the speed selector set at "45 rpm" position, further adjust the variable resistor VR6 so that strobo signal pulse and frequency generator's signal pulse will be shown in Figure 41.

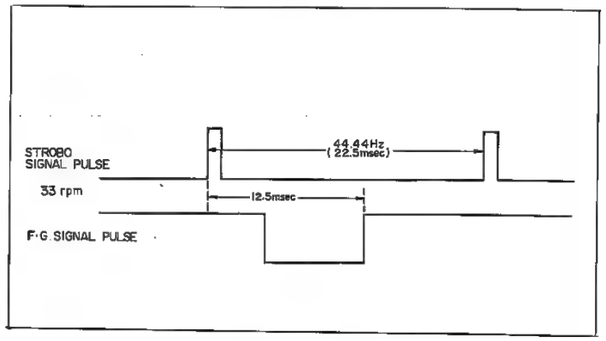


Figure 40

TONEARM RETURN DETECTOR ADJUSTMENT

1. Put the tonearm onto its tonearm rest.
2. Connect a VTVM between TP1-(14) and TP1-(13) (GND).
3. Adjust the variable resistor VR301 so that the VTVM reads 0.2 V.

DETECTED SENSITIVITY ADJUSTMENT

1. Put the tonearm onto its tonearmrest.
2. Set the speed selector to "33 rpm" position.
3. Connect a VTVM between TP1-(11) and TP1-(13) (GND).
4. Adjust the variable resistor VR302 so that the VTVM reads 0.4 V.
5. Set the speed selector to "45 rpm" position, and make sure the VTVM shows 0.44 V.

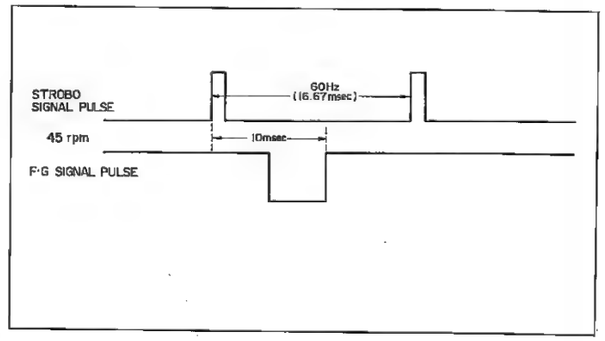


Figure 41

ADJUSTMENT OF MOTOR DRIVE ADJUSTMENT

1. Connect one end of a dual-beam synchroscope, on the control PWB, between pin (13) (GND) and pin (8) and another between pin (13) (GND) and pin (7).
2. Turn the variable resistors VR2 and VR3 to generate two waveforms and adjust so that these two will have symmetry verticalit, as shown in Figure 42.
3. Adjust the variable resistor VR1 so that the two waveforms will be the same in their peaks.

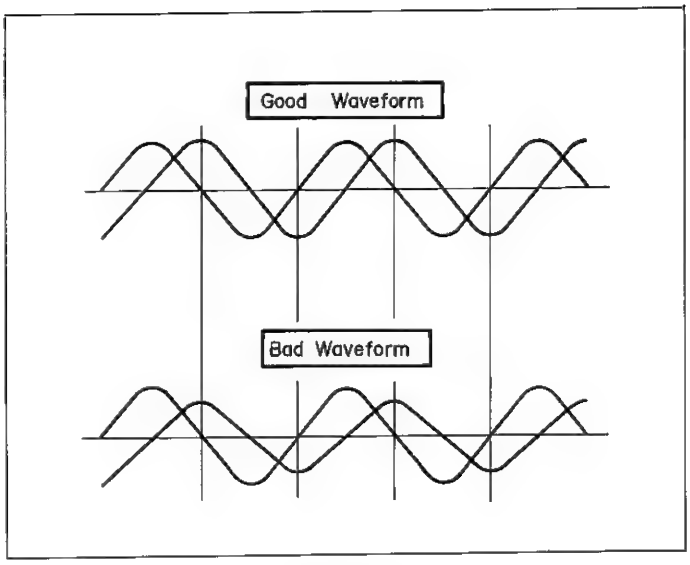


Figure 42

PITCH FINE ADJUSTMENT

1. Set the pitch adjust controls VR33 and VR45 to their respective mechanical center position.
2. Setting the speed selector at "33 rpm" position, adjust the variable resistor VR32 so that stripe patterns of the stroboscope will be motionless.
3. Next with the speed selector set at "45 rpm" position, further adjust the variable resistor VR44 so that stripe patterns of the stroboscope will be motionless.

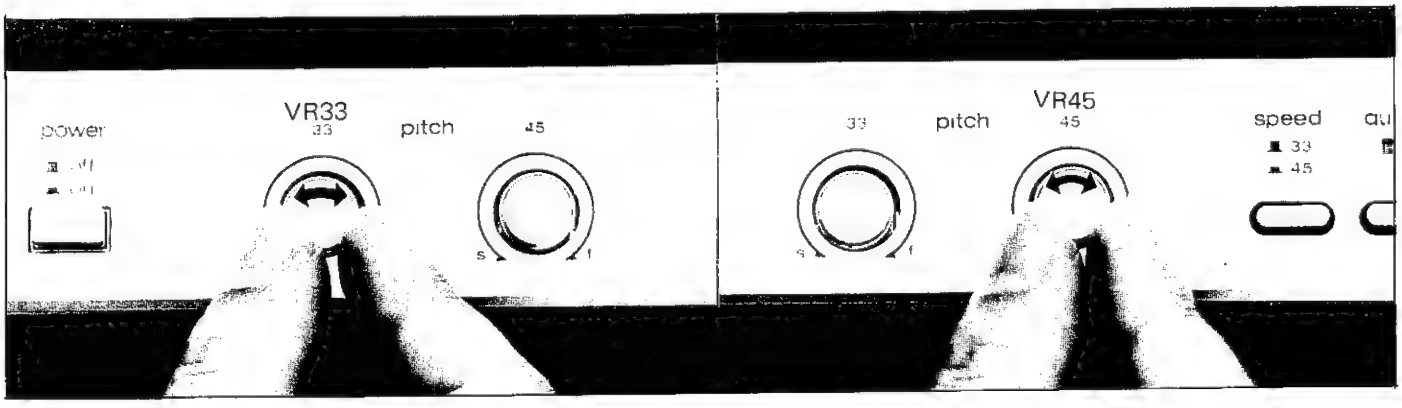
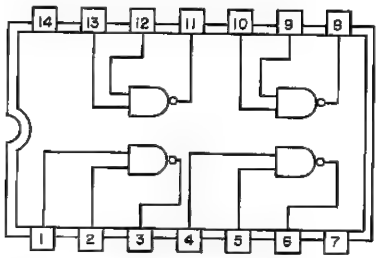


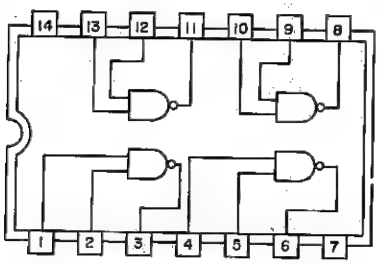
Figure 43

FREQUENCY ADJUSTMENT

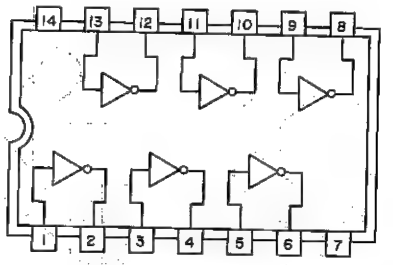
1. Connect a frequency counter between pin (33) (GND) and pin (14), respectively of the control PWB.
2. Adjust the variable capacitor VC1 so that the frequency counter will read 44.44 Hz with the speed selector set at "33 rpm" position.
3. Next with the speed selector set at "45 rpm" position, see that the frequency counter will indicate 60.00 Hz.



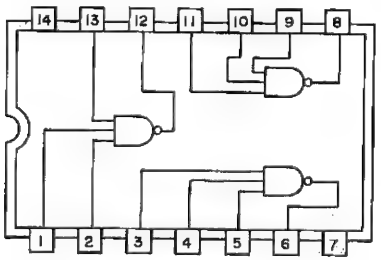
RH-IX1135AFZZ



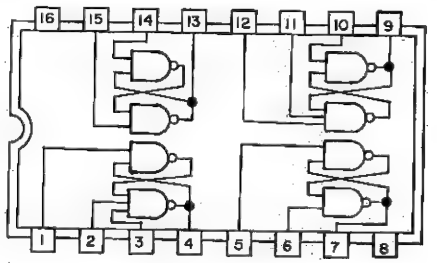
RH-IX1137AFZZ



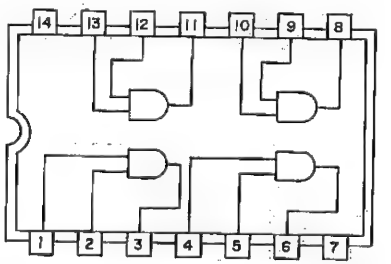
RH-IX1138AFZZ



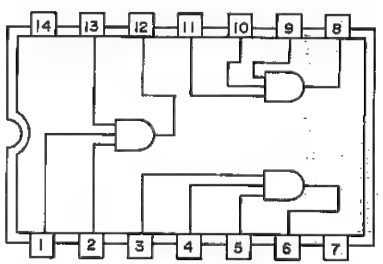
RH-IX1140AFZZ



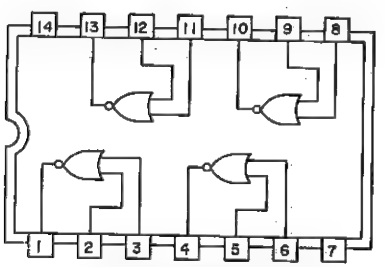
RH-IX1134AFZZ



RH-IX1139AFZZ

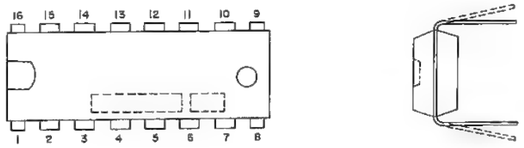


RH-IX1141AFZZ



RH-IX1136AFZZ

Figure 44 TOP VIEW OF LOGICAL IC



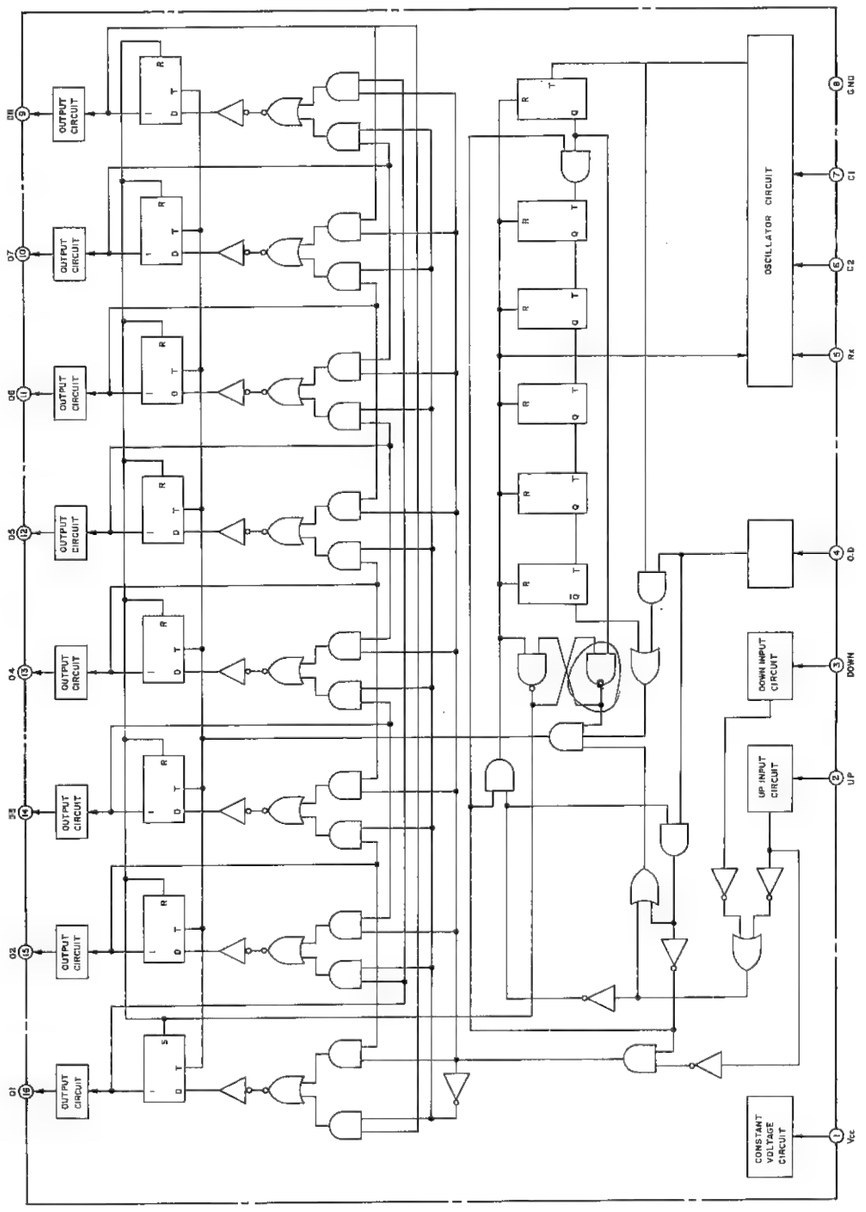


Figure 45 EQUIVALENT OF INTEGRATED CIRCUIT (IC201)

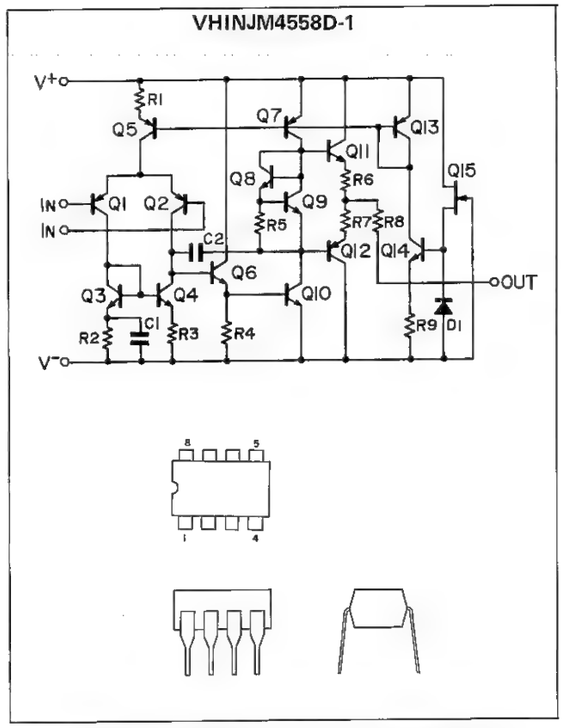


Figure 46 EQUIVALENT OF INTEGRATED CIRCUIT (IC1, 2, 202)

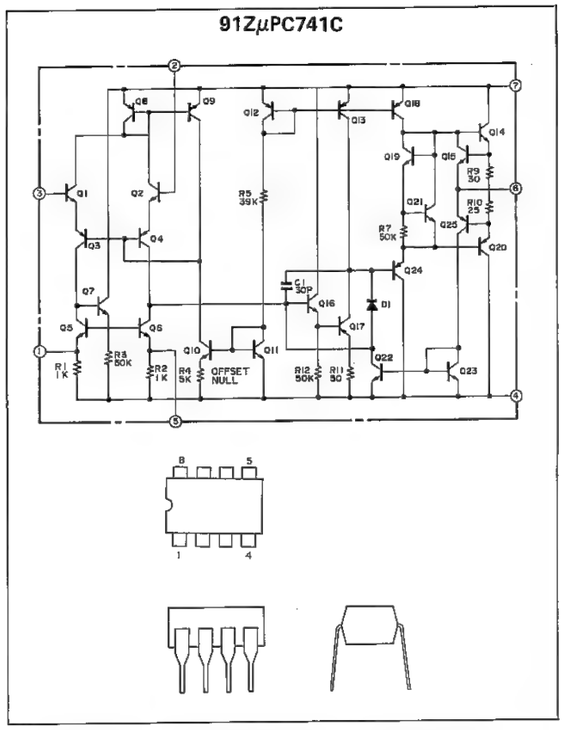


Figure 47 EQUIVALENT OF INTEGRATED CIRCUIT (IC301)

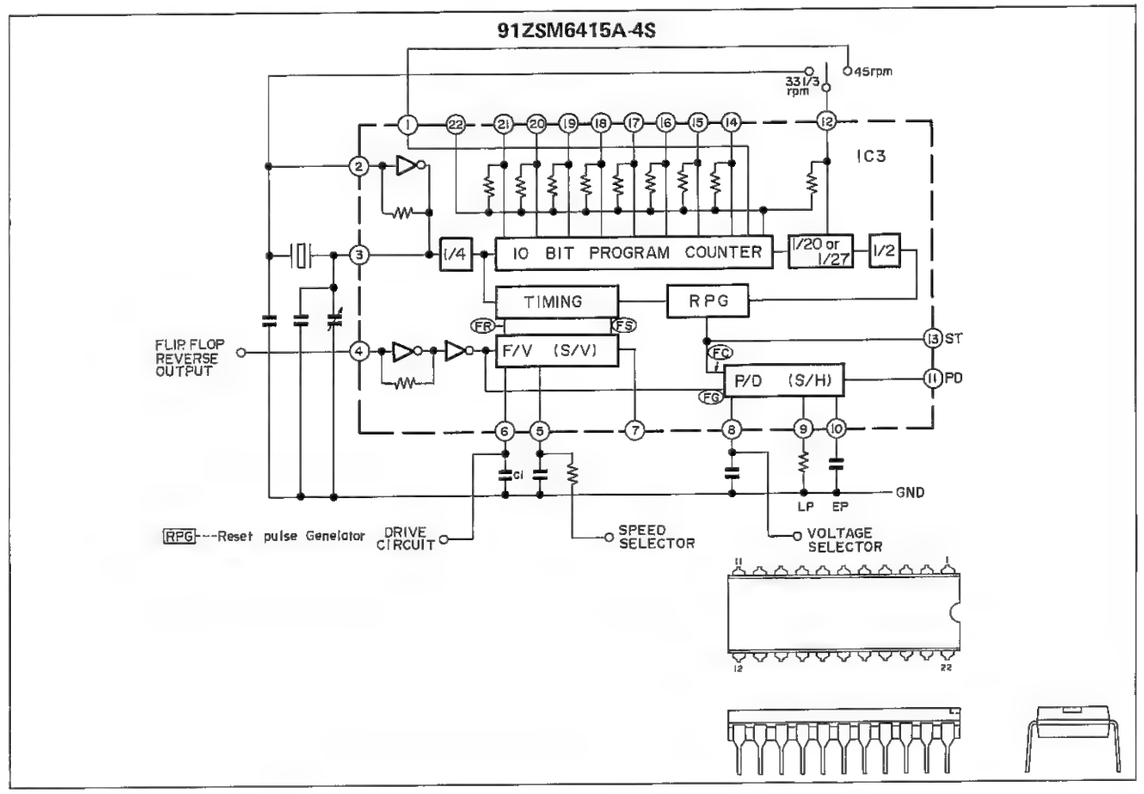
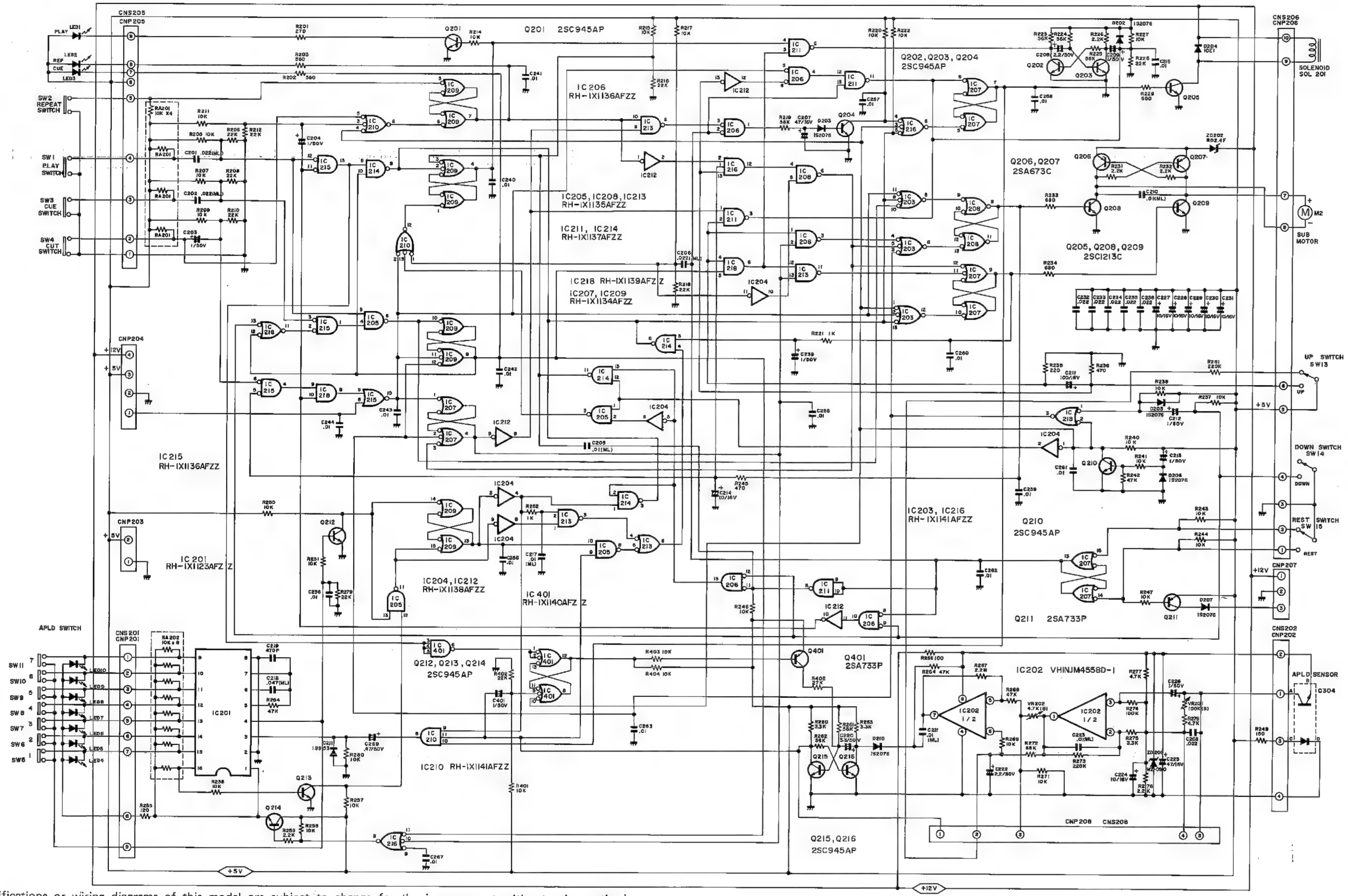
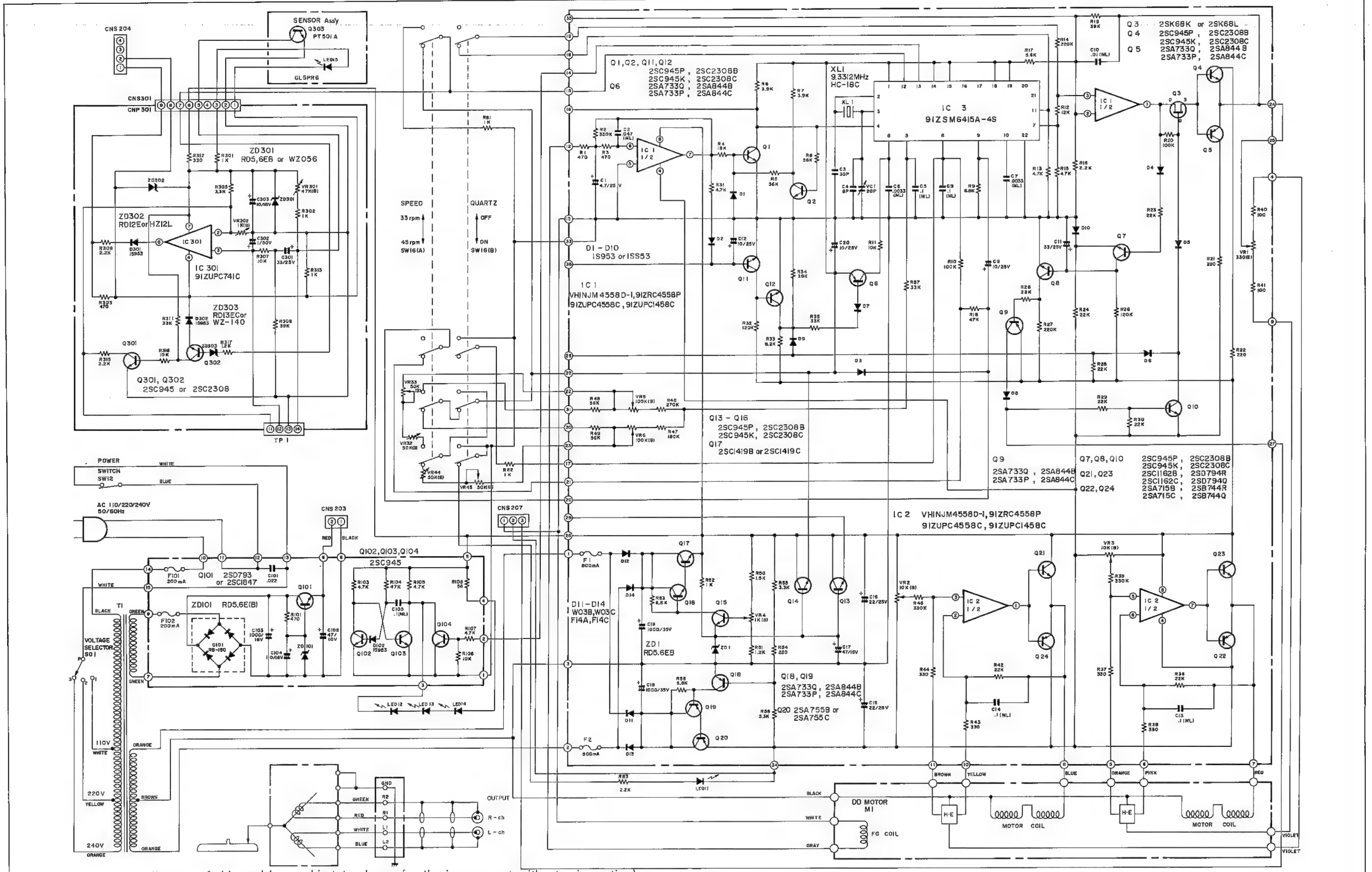


Figure 48 BLOCK DIAGRAM OF INTEGRATED CIRCUIT (IC3)



(Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.)

Figure 49 SCHEMATIC DIAGRAM OF LOGICAL CIRCUIT



(Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.)

Figure 50 SCHEMATIC DIAGRAM OF CONTROL CIRCUIT

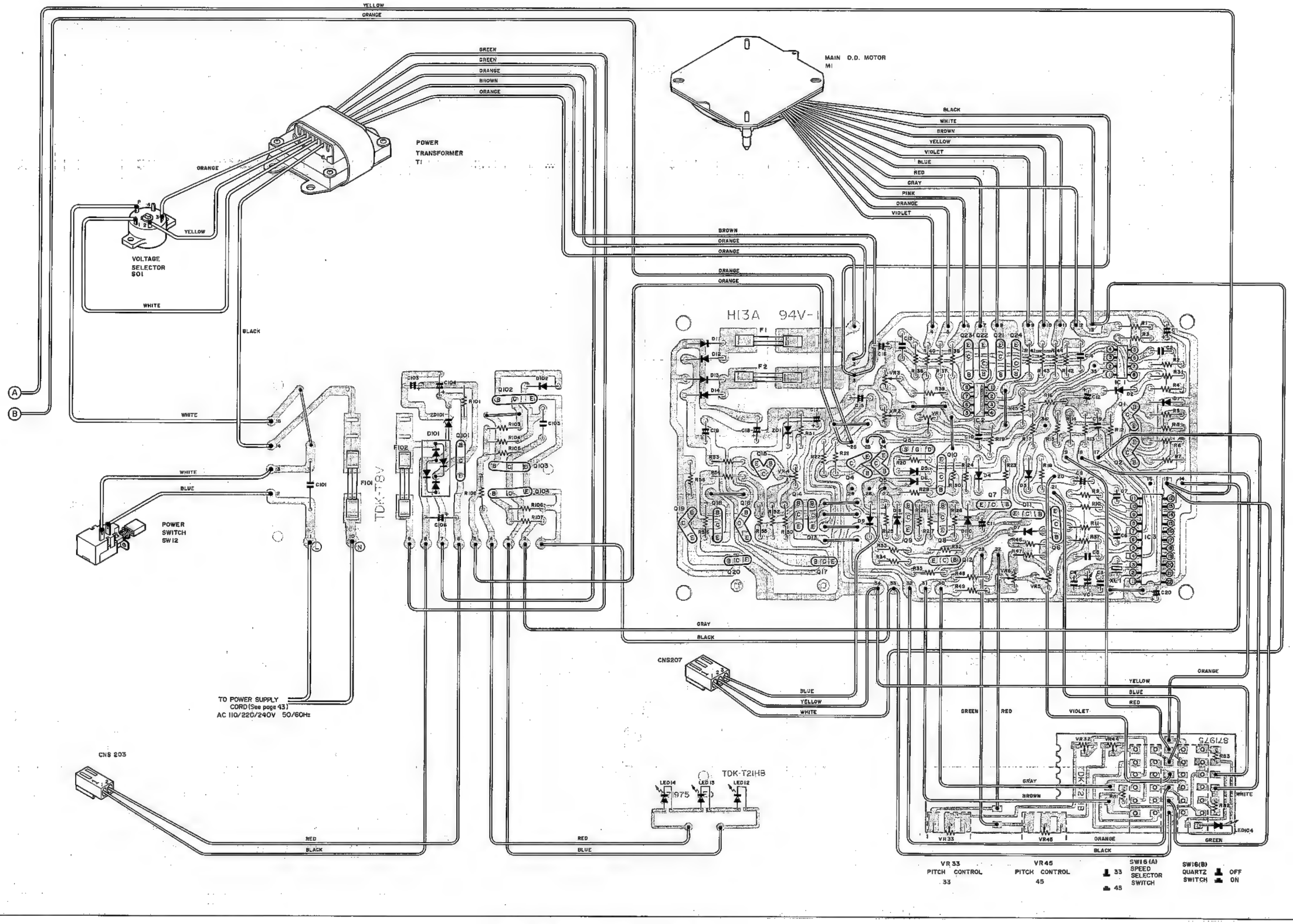


Figure 51 WIRING SIDE OF P.W.BOARD

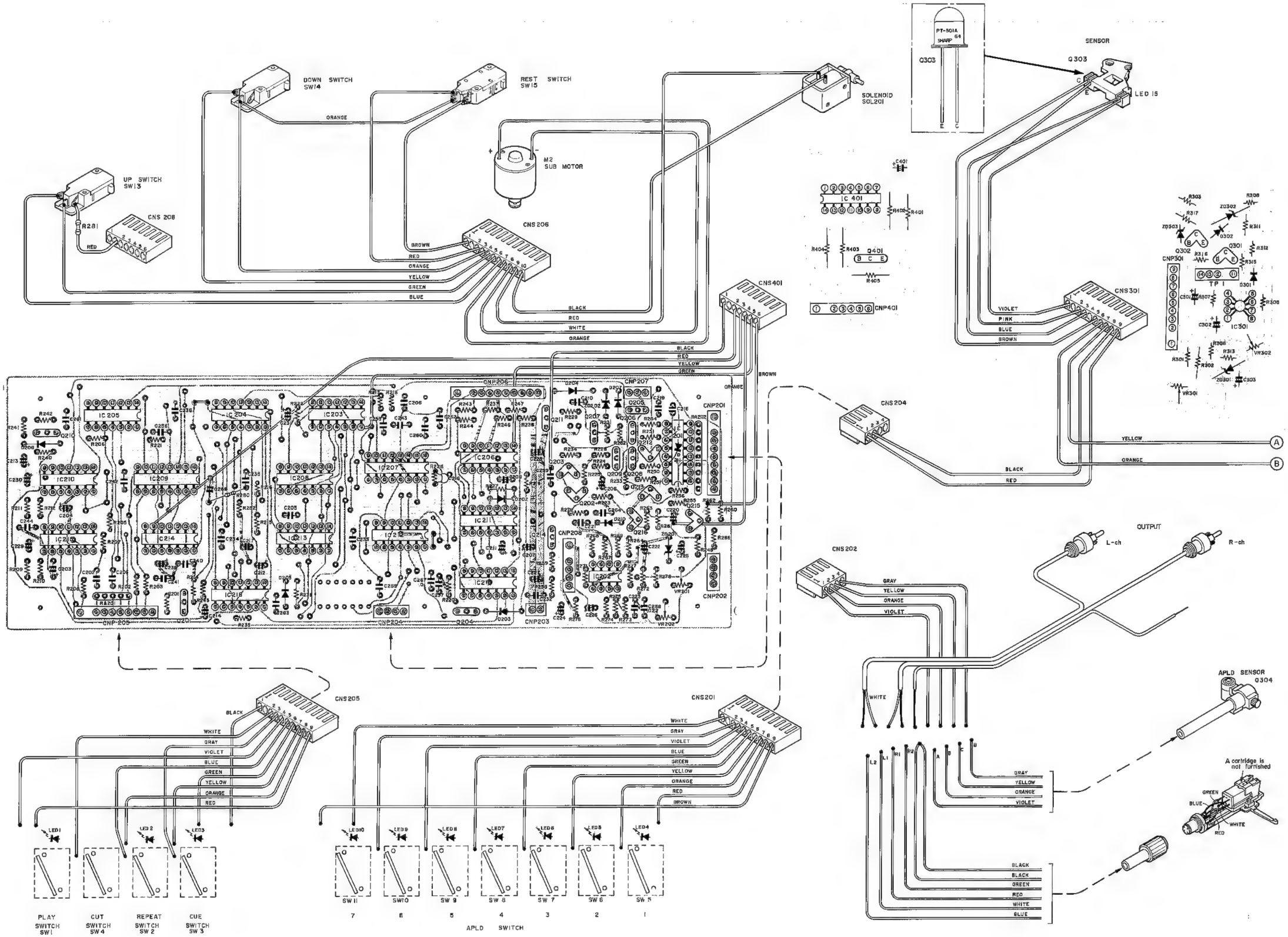


Figure 52 WIRING SIDE OF P.W.BOARD

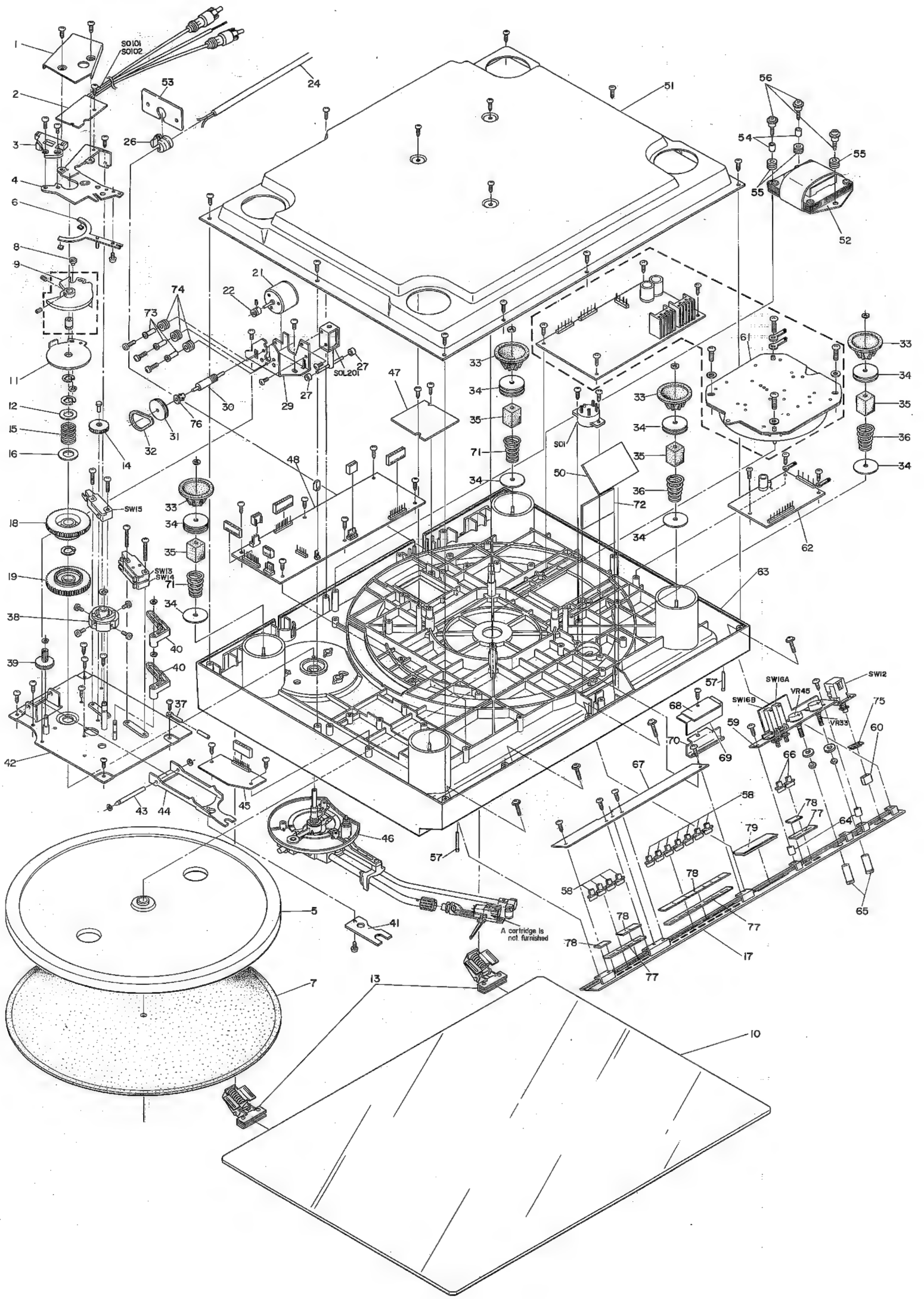


Figure 53 CABINET EXPLODED VIEW

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

REF. NO.	PART NO.	DESCRIPTION	CODE
		INTEGRATED CIRCUITS	
IC1	VHINJM4558D-1 91ZRC4558P 91ZμPC4558C 91ZμPC1458C	Operation Amplifier (NJM4558D, RC4558P, μPC4558C, μPC1458C)	AH
IC2	VHINJM4558D-1 91ZRC4558P 91ZμPC4558C 91ZμPC1458C	Operation Amplifier (NJM4558D, RC4558P, μPC4558C, μPC1458C)	AH
IC3	91ZSM6415A-4S	PLL IC (SM-6415A-4S)	AQ
IC201	RH-IX1123AFZZ	Shift Register (M54832P)	AT
IC202	VHINJM4558D-1	Operation Amplifier (NJM4558D)	AH
IC203	RH-IX1141AFZZ	3 AND (SN74LS11)	AE
IC204	RH-IX1138AFZZ	Hex Inverter (SN74LS04)	AE
IC205	RH-IX1135AFZZ	4 NAND (SN74LS00)	AE
IC206	RH-IX1136AFZZ	4 NOR (SN74LS02)	AE
IC207	RH-IX1134AFZZ	S-R Latches (SN74279)	AH
IC208	RH-IX1135AFZZ	4 NAND (SN74LS00)	AE
IC209	RH-IX1134AFZZ	S-R Latches (SN74279)	AH
IC210	RH-IX1141AFZZ	3 AND (SN74LS11)	AE
IC211	RH-IX1137AFZZ	4 NAND (SN74LS03)	AE
IC212	RH-IX1138AFZZ	Hex Inverter (SN74LS04)	AE
IC213	RH-IX1135AFZZ	4 NAND (SN74LS00)	AE
IC214	RH-IX1137AFZZ	4 NAND (SN74LS03)	AE
IC215	RH-IX1136AFZZ	4 NOR (SN74LS02)	AE
IC216	RH-IX1141AFZZ	3 AND (SN74LS11)	AE
IC218	RH-IX1139AFZZ	4 AND (SN74LS08)	AE
IC301	91ZμPC741C	Operation Amplifier (μPC741C)	AQ
IC401	RH-IX1140AFZZ	3 NAND (SN74LS10)	AE
		TRANSISTORS	
Q1	91Z2SC945P 91Z2SC945K 91Z2SC2308C 91Z2SC2308B	Flip-Flop (2SC945P, 2SC945K, 2SC2308C, 2SC2308B)	AD
Q2	91Z2SC945P 91Z2SC945K 91Z2SC2308C 91Z2SC2308B	Flip-Flop (2SC945P, 2SC945K, 2SC2308C, 2SC2308B)	AD
Q3	91Z2SK68K 91Z2SK68L	FET, Voltage Switching (2SK68K, 2SK68L)	AF
Q4	91Z2SC945P 91Z2SC945K 91Z2SC2308C 91Z2SC2308B	Position Detect (2SC945P, 2SC945K, 2SC2308C, 2SC2308B)	AD
Q5	91Z2SA733Q 91Z2SA733P 91Z2SA844B 91Z2SA844C	Position Detect (2SA733Q, 2SA733P, 2SA844B, 2SA844C)	AE
Q6	91Z2SA733Q 91Z2SA733P 91Z2SA844B 91Z2SA844C	Drive (2SA733Q, 2SA733P, 2SA844B, 2SA844C)	AE
Q7	91Z2SC945P 91Z2SC945K 91Z2SC2308C 91Z2SC2308B	Reverse Rotation Detector (2SC945P, 2SC945K, 2SC2308C, 2SC2308B)	AD
Q8	91Z2SC945P 91Z2SC945K 91Z2SC2308C 91Z2SC2308B	Reverse Rotation Detector (2SC945P, 2SC945K, 2SC2308C, 2SC2308B)	AD
Q9	91Z2SA733Q 91Z2SA733P 91Z2SA844B 91Z2SA844C	Reverse Rotation Detector (2SA733Q, 2SA733P, 2SA844B, 2SA844C)	AE
Q10	91Z2SC945P 91Z2SC945K 91Z2SC2308C 91Z2SC2308B	Reverse Rotation Detector (2SC945P, 2SC945K, 2SC2308C, 2SC2308B)	AD
Q11	91Z2SC945P 91Z2SC945K 91Z2SC2308C 91Z2SC2308B	Driver (2SC945P, 2SC945K, 2SC2308C, 2SC2308B)	AD
Q12	91Z2SC945P 91Z2SC945K 91Z2SC2308C 91Z2SC2308B	Driver (2SC945P, 2SC945K, 2SC2308C, 2SC2308B)	AD
Q13	91Z2SC945P 91Z2SC945K 91Z2SC2308C 91Z2SC2308B	Constant Voltage (2SC945P, 2SC945K, 2SC2308C, 2SC2308B)	AD
Q14	91Z2SC945P 91Z2SC945K 91Z2SC2308C 91Z2SC2308B	Constant Voltage (2SC945P, 2SC945K, 2SC2308C, 2SC2308B)	AD
Q15	91Z2SC945P 91Z2SC945K 91Z2SC2308C 91Z2SC2308B	Constant Voltage (2SC945P, 2SC945K, 2SC2308C, 2SC2308B)	AD
Q16	91Z2SC945P 91Z2SC945K 91Z2SC2308C 91Z2SC2308B	Constant Voltage (2SC945P, 2SC945K, 2SC2308C, 2SC2308B)	AD
Q17	91Z2SC1419B 91Z2SC1419C	Constant Voltage (2SC1419B, 2SC1419C)	AG
Q18	91Z2SA733Q 91Z2SA733P 91Z2SA844B 91Z2SA844C	Constant Voltage (2SA733Q, 2SA733P, 2SA844B, 2SA844C)	AE
Q19	91Z2SA733Q 91Z2SA733P 91Z2SA844B 91Z2SA844C	Constant Voltage (2SA733Q, 2SA733P, 2SA844B, 2SA844C)	AE
Q20	91Z2SA755B 91Z2SA755C	Constant Voltage (2SA755B, 2SA755C)	AF

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
Q21	91Z2SC1162B 91Z2SC1162C 91Z2SD794R 91Z2SD794Q	Motor Drive (2SC1162B, 2SC1162C, 2SD794R, 2SD794Q)	AG
Q22	91Z2SA715B 91Z2SA715C 91Z2SB744R 91Z2SB744Q	Motor Drive (2SA715B, 2SA715C, 2SB744R, 2SB744Q)	AG
Q23	91Z2SC1162B 91Z2SC1162C 91Z2SD794R 91Z2SD794Q	Motor Drive (2SC1162B, 2SC1162C, 2SD794R, 2SD794Q)	AG
Q24	91Z2SA715B 91Z2SA715C 91Z2SB744R 91Z2SB744Q	Motor Drive (2SA715B, 2SA715C, 2SB744R, 2SB744Q)	AG
Q101	91Z2SD793 91Z2SC1847	Regulator (2SD793, 2SC1847)	AG
Q102	91Z2SC945	Flip-Flop (2SC945)	AD
Q103	91Z2SC945	Flip-Flop (2SC945)	AD
Q104	91Z2SC945	Switching (2SC945)	AD
Q201	91Z2SC945AP	Switching (Play Indicator) (2SC945AP)	AD
Q202	91Z2SC945AP	Flip-Flop (2SC945AP)	AD
Q203	91Z2SC945AP	Flip-Flop (2SC945AP)	AD
Q204	91Z2SC945AP	Timer (2SC945AP)	AD
Q205	91Z2SC1213C	Solenoid Drive (2SC1213C)	AG
Q206	91Z2SA673C	Sub Motor Drive (2SA673C)	AG
Q207	91Z2SA673C	Sub Motor Drive (2SA673C)	AG
Q208	91Z2SC1213C	Sub Motor Drive (2SC1213C)	AG
Q209	91Z2SC1213C	Sub Motor Drive (2SC1213C)	AG
Q210	91Z2SC945AP	Flip-Flop Reset (2SC945AP)	AD
Q211	91Z2SA733P	D.D. Motor Drive (2SA733P)	AE
Q212	91Z2SC945AP	Switching (2SC945AP)	AD
Q213	91Z2SC945AP	Switching (2SC945AP)	AD
Q214	91Z2SC945AP	Switching (2SC945AP)	AD
Q215	91Z2SC945AP	Flip-Flop (2SC945AP)	AD
Q216	91Z2SC945AP	Flip-Flop (2SC945AP)	AD
Q301	91Z2SC945 91Z2SC2308	Speed Selector (2SC945, 2SC2308)	AD
Q302	91Z2SC945 91Z2SC2308	Speed Selector (2SC945, 2SC2308)	AD
Q303	VHPPT-501A/-1	Photo Transistor (PT-501A)	AR
Q304	RH-PX1014AFZZ	APLD Sensor (GP-453)	AR
Q401	91Z2SA733P	Switching (2SA733P)	AE
		DIODES	
D1	91Z1S953 91Z1SS53	Regulator (1S953, 1SS53)	AC
D2	91Z1S953 91Z1SS53	Regulator (1S953, 1SS53)	AC
D3	91Z1S953 91Z1SS53	Starter (1S953, 1SS53)	AC
D4	91Z1S953 91Z1SS53	Reverse Detector (1S953, 1SS53)	AC
D5	91Z1S953 91Z1SS53	Reverse Detector (1S953, 1SS53)	AC
D6	91Z1S953 91Z1SS53	Reverse Detector (1S953, 1SS53)	AC
D7	91Z1S953 91Z1SS53	Starter (1S953, 1SS53)	AC
D8	91Z1S953 91Z1SS53	Reverse Detector (1S953, 1SS53)	AC
D9	91Z1S953 91Z1SS53	Starter (1S953, 1SS53)	AC
D10	91Z1S953 91Z1SS53	Reverse Detector (1S953, 1SS53)	AC
D11	91ZW03B 91ZW03C 91ZF14A 91ZF14C	Rectifier (W03B, W03C, F14A, F14C)	AE
D12	91ZW03B 91ZW03C 91ZF14A 91ZF14C	Rectifier (W03B, W03C, F14A, F14C)	AE
D13	91ZW03B 91ZW03C 91ZF14A 91ZF14C	Rectifier (W03B, W03C, F14A, F14C)	AE
D14	91ZW03B 91ZW03C 91ZF14A 91ZF14C	Rectifier (W03B, W03C, F14A, F14C)	AE
D101	91ZRB-150	Rectifier (RB-150)	AG
D102	91Z1S953	Level Shift (1S953)	AC
D202	91Z1S2076	Protector (1S2076)	AC
D203	91Z1S2076	Timer (1S2076)	AC
D204	91Z10E1	Protector (10E1)	AC
D205	91Z1S2076	Protector (1S2076)	AC
D206	91Z1S2076	Discharger (1S2076)	AC
D207	91Z1S2076	DD Motor Drive (1S2076)	AC
D210	91Z1S2076	Protector (1S2076)	AC
D211	91Z1S953	Protector (1S953)	AC
D301	91Z1S953	Level Shift (1S953)	AC
D302	91Z1S953	Protector (1S953)	AC
		ZENER DIODES	
ZD1	91ZRD5.6EB	Regulator (RD5.6EB)	AG
ZD101	91ZRD5.6EB	Regulator (RD5.6EB)	AG
ZD201	91ZWZ-090	Regulator (WZ-090)	AG
ZD202	91ZRD2.4F	Level Shift (RD2.4F)	AF
ZD301	91ZWZ-056 91ZRD5.6EB	Regulator (WZ-056, RD5.6EB)	AG
ZD302	91ZRD12E 91ZHZ12L	Regulator (RD12E, HZ12L)	AG
ZD303	91ZRD13EC 91ZWZ-140	Regulator (RD13EC, WZ-140)	AG
		LED (Light Emitting Diode)	
LED1	VHPGL-9NG12-1	Play Indicator (GL-9NG12)	AD
LED2	RH-PX1008AFZZ	Repeat Indicator (GL-9PR2)	AE
LED3	RH-PX1008AFZZ	Cue Indicator (GL-9PR2)	AE
LED4	VHPGL-9NG12-1	APLD Number Indicator (GL-9NG12)	AD
LED5	VHPGL-9NG12-1	APLD Number Indicator (GL-9NG12)	AD
LED6	VHPGL-9NG12-1	APLD Number Indicator (GL-9NG12)	AD
LED7	VHPGL-9NG12-1	APLD Number Indicator (GL-9NG12)	AD
LED8	VHPGL-9NG12-1	APLD Number Indicator (GL-9NG12)	AD
LED9	VHPGL-9NG12-1	APLD Number Indicator (GL-9NG12)	AD

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
LED10	VHPGL-9NG12-1	APLD Number Indicator (GL-9NG12)	AD
LED11	RH-PX1008AFZZ	Quartz Indicator (GL-9PR2)	AE
LED12	91ZEB-5505	Strobo (EB-5505)	AF
LED13	91ZEB-5505	Strobo (EB-5505)	AF
LED14	91ZEB-5505	Strobo (EB-5505)	AF
LED15	VHPGL5PR6//-1	Return Sensor (GL-5PR6)	AH
		CRYSTAL	
XL1	91ZHC-18C	Oscillation Frequency, 9.3312MHz	AQ
		TRANSFORMER	
T1	91Z872039	Power	AZ
		CONTROLS	
VC1	91Z60726	Frequency Adjust	AE
VR1	91ZSR19R330	330 ohm (B), Balance Adjust	AE
VR2	91ZSR19R10K	10K ohm (B), Motor Drive Adjust	AE
VR3	91ZSR19R10K	10K ohm (B), Motor Drive Adjust	AE
VR4	91ZSR19R1K	1K ohm (B), Constant Voltage Adjust	AE
VR5	91ZSR19R100K	100K ohm (B), Quarts Lock Timing Adjust	AE
VR6	91ZSR19R100K	100K ohm (B), Quarts Lock Timing Adjust	AE
VR32	91ZV8K-1	50K ohm (B), Pitch Fine Adjust	AE
VR33	91Z702986-1	50K ohm (B), Pitch Adjust (33 rpm)	AG
VR44	91ZV8K-1	50K ohm (B), Pitch Fine Adjust	AE
VR45	91Z702986-1	50K ohm (B), Pitch Adjust (45 rpm)	AG
VR201	RVR-M0065AGZZ	100K ohm (B), APLD Control Adjust	AF
VR202	RVR-M0084AGZZ	4.7K ohm (B), APLD Control Adjust	AG
VR301	91ZSR19R47K	47K ohm (B), Auto Return Adjust	AE
VR302	91ZSR19R1K	1K ohm (B), Auto Return Adjust	AE
		PACKAGED CIRCUITS	
RA201	91ZRM4-103K	10K ohm x 4	AG
RA202	91ZRM8-103K	10K ohm x 8	AG

ELECTROLYTIC CAPACITORS

(Unless otherwise specified capacitors are +50 −10%, Electrolytic type.)

C1	VCEAAU1EW475A	4.7MFD, 25V, +75 −10%	AB
C8	VCEAAU1EW106Y	10MFD, 25V	AB
C11	VCEAAU1EW336Y	33MFD, 25V	AC
C12	VCEAAU1EW106Y	10MFD, 25V	AB
C15	VCEAAU1EW226Y	22MFD, 25V	AC
C16	VCEAAU1EW226Y	22MFD, 25V	AC
C17	VCEAAU1CW476Y	47MFD, 16V	AC
C18	VCEAAU1VW108Y	1000MFD, 35V	AG
C19	VCEAAU1VW108Y	1000MFD, 35V	AG
C20	VCEAAU1EW106Y	10MFD, 25V	AB
C103	VCEAAU1CW108Y	1000MFD, 16V	AE
C104	VCEAAU1CW106Y	10MFD, 16V	AB
C106	VCEAAU1AW476Y	47MFD, 10V	AB
C203	VCEAAU1HW105A	1MFD, 50V, +75 −10%	AB
C204	VCEAAU1HW105A	1MFD, 50V, +75 −10%	AB
C207	VCEAAU1CW476Y	47MFD, 16V	AC
C208	VCEAAU1HW225M	2.2MFD, 50V, ±20%	**
C209	VCEAAU1HW105A	1MFD, 50V, +75 −10%	AB
C211	VCEAAU1CW107Y	100MFD, 16V	AC
C212	VCEAAU1HW105A	1MFD, 50V, +75 −10%	AB
C213	VCEAAU1HW105A	1MFD, 50V, +75 −10%	AB
C214	VCEAAU1CW106Y	10MFD, 16V	AB
C220	VCEAAU1HW335M	3.3MFD, 50V, ±20%	AB
C222	VCEAAU1HW225M	2.2MFD, 50V, ±20%	**
C224	VCEAAU1CW106Y	10MFD, 16V	AB
C225	VCEAAU1CW476Y	47MFD, 16V	AC
C226	VCEAAU1HW105A	1MFD, 50V, +75 −10%	AB
C227	VCEAAU1CW106Y	10MFD, 16V	AB
C228	VCEAAU1CW106Y	10MFD, 16V	AB
C229	VCEAAU1CW106Y	10MFD, 16V	AB
C230	VCEAAU1CW106Y	10MFD, 16V	AB
C231	VCEAAU1CW106Y	10MFD, 16V	AB
C239	VCEAAU1HW105A	1MFD, 50V, +75 −10%	AB
C269	VCEAAU1HW474M	.47MFD, 50V, ±20%	**
C301	VCEAAU1HW336Y	33MFD, 50V	AC
C302	VCEAAU1HW105A	1MFD, 50V, +75 −10%	AB
C303	VCEAAU1CW106Y	10MFD, 16V	AB
C401	VCEAAU1HW105M	1MFD, 50V, ±20%	**

CAPACITORS

(Unless otherwise specified capacitors are 50V, +80 −20%, Ceramic type.)

C2	VCQYKU1HM473K	.047MFD, 50V, ±10%, Mylar	AC
C3	VCCSPU1HL300K	30PF, 50V, ±10%, Ceramic	AA
C4	VCCSPU1HL9R0K	9PF, 50V, ±10%, Ceramic	**
C5	VCQYKU1HM104K	.1MFD, 50V, ±10%, Mylar	AC
C6	VCQYKU1HM332K	.0033MFD, 50V, ±10%, Mylar	AB
C7	VCQYKU1HM332K	.0033MFD, 50V, ±10%, Mylar	AB
C9	VCQYKU1HM104K	.1MFD, 50V, ±10%, Mylar	AC
C10	VCQYKU1HM103K	.01MFD, 50V, ±10%, Mylar	AB
C13	VCQYKU1HM104K	.1MFD, 50V, ±10%, Mylar	AC
C14	VCQYKU1HM104K	.1MFD, 50V, ±10%, Mylar	AC
C101	91ZPME271Y	.022MFD, 250V	AE
C105	VCQYKU1HM104K	.1MFD, 50V, ±10%, Mylar	AC
C201	VCQYKU1HM223K	.022MFD, 50V, ±10%, Mylar	AB
C202	VCQYKU1HM223K	.022MFD, 50V, ±10%, Mylar	AB
C205	VCQYKU1HM103K	.01MFD, 50V, ±10%, Mylar	AB
C206	VCQYKU1HM223K	.022MFD, 50V, ±10%, Mylar	AB
C210	VCQYKU1HM103K	.01MFD, 50V, ±10%, Mylar	AB
C216	VCCSPU1HL103Z	.01MFD	**
C217	VCQYKU1HM103K	.01MFD, 50V, ±10%, Mylar	AB
C218	VCQYKU1HM473K	.047MFD, 50V, ±10%, Mylar	AC
C219	VCCSPU1HL471Z	470PF	**
C221	VCQYKU1HM103K	.01MFD, 50V, ±10%, Mylar	AB
C223	VCQYKU1HM103K	.01MFD, 50V, ± 10%, Mylar	AB
C232	VCKZPU1HF223Z	.022MFD	AA
C233	VCKZPU1HF223Z	.022MFD	AA

**; Price will be quoted upon receipt of order.

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
C234	VCKZPU1HF223Z	.022MFD	AA
C235	VCKZPU1HF223Z	.022MFD	AA
C236	VCKZPU1HF223Z	.022MFD	AA
C240	VCCSPU1HL103Z	.01MFD	**
C241	VCCSPU1HL103Z	.01MFD	**
C242	VCCSPU1HL103Z	.01MFD	**
C243	VCCSPU1HL103Z	.01MFD	**
C244	VCCSPU1HL103Z	.01MFD	**
C255	VCCSPU1HL103Z	.01MFD	**
C256	VCCSPU1HL103Z	.01MFD	**
C257	VCCSPU1HL103Z	.01MFD	**
C258	VCCSPU1HL103Z	.01MFD	**
C259	VCCSPU1HL103Z	.01MFD	**
C260	VCCSPU1HL103Z	.01MFD	**
C261	VCCSPU1HL103Z	.01MFD	**
C262	VCCSPU1HL103Z	.01MFD	**
C263	VCCSPU1HL103Z	.01MFD	**
C264	VCCSPU1HL103Z	.01MFD	**
C267	VCCSPU1HL103Z	.01MFD	**
C268	VCKZPU1HF223Z	.022MFD	AA

RESISTORS

(Unless otherwise specified resistors are 1/4W, ±5%, Carbon type.)

R1	VRD-ST2EE471J	470 ohm	AA
R2	VRD-ST2EE334J	330K ohm	AA
R3	VRD-ST2EE471J	470 ohm	AA
R4	VRD-ST2EE183J	18K ohm	AA
R5	VRD-ST2EE563J	56K ohm	AA
R6	VRD-ST2EE392J	3.9K ohm	AA
R7	VRD-ST2EE392J	3.9K ohm	AA
R8	VRD-ST2EE563J	56K ohm	AA
R9	VRD-ST2EE682J	6.8K ohm	AA
R10	VRD-ST2EE104J	100K ohm	AA
R11	VRD-ST2EE103J	10K ohm	AA
R12	VRD-ST2EE123J	12K ohm	AA
R13	VRD-ST2EE472J	4.7K ohm	AA
R14	VRD-ST2EE224J	220K ohm	AA
R15	VRD-ST2EE472J	4.7K ohm	AA
R16	VRD-ST2EE222J	2.2K ohm	AA
R17	VRD-ST2EE562J	5.6K ohm	AA
R18	VRD-ST2EE473J	47K ohm	AA
R19	VRD-ST2EE393J	39K ohm	AA
R20	VRD-ST2EE104J	100K ohm	AA
R21	VRD-ST2EE221J	220 ohm	AA
R22	VRD-ST2EE221J	220 ohm	AA
R23	VRD-ST2EE223J	22K ohm	AA
R24	VRD-ST2EE223J	22K ohm	AA
R25	VRD-ST2EE223J	22K ohm	AA
R26	VRD-ST2EE124J	120K ohm	AA
R27	VRD-ST2EE224J	220K ohm	AA
R28	VRD-ST2EE223J	22K ohm	AA
R29	VRD-ST2EE223J	22K ohm	AA
R30	VRD-ST2EE223J	22K ohm	AA
R31	VRD-ST2EE472J	4.7K ohm	AA
R32	VRD-ST2EE124J	120K ohm	AA
R33	VRD-ST2EE822J	8.2K ohm	AA
R34	VRD-ST2EE393J	39K ohm	AA
R35	VRD-ST2EE333J	33K ohm	AA
R36	VRD-ST2EE223J	22K ohm	AA
R37	VRD-ST2EE331J	330 ohm	AA
R38	VRD-ST2EE331J	330 ohm	AA
R39	VRD-ST2EE334J	330K ohm	AA
R40	VRD-ST2EE101J	100 ohm	AA
R41	VRD-ST2EE101J	100 ohm	AA
R42	VRD-ST2EE223J	22K ohm	AA
R43	VRD-ST2EE331J	330 ohm	AA
R44	VRD-ST2EE331J	330 ohm	AA
R45	VRD-ST2EE334J	330K ohm	AA
R46	VRD-ST2EE274J	270K ohm	AA
R47	VRD-ST2EE184J	180K ohm	AA
R48	VRD-ST2EE563J	56K ohm	AA
R49	VRD-ST2EE563J	56K ohm	AA
R50	VRD-ST2EE152J	1.5K ohm	AA
R51	VRD-ST2EE122J	1.2K ohm	AA
R52	VRD-ST2EE102J	1K ohm	AA
R53	VRD-ST2EE682J	6.8K ohm	AA
R54	VRD-ST2EE221J	220 ohm	AA
R55	VRD-ST2EE332J	3.3K ohm	AA
R56	VRD-ST2EE332J	3.3K ohm	AA
R57	VRD-ST2EE333J	33K ohm	AA
R58	VRD-ST2EE682J	6.8K ohm	AA
R81	VRD-ST2EY102J	1K ohm	AA
R82	VRD-ST2EY102J	1K ohm	AA
R83	VRD-ST2EY222J	2.2K ohm	AA
R101	VRD-ST2EE471J	470 ohm	AA
R103	VRD-ST2EE472J	4.7K ohm	AA
R104	VRD-ST2EE473J	47K ohm	AA
R105	VRD-ST2EE472J	4.7K ohm	AA
R106	VRD-ST2EE103J	10K ohm	AA
R107	VRD-ST2EE472J	4.7K ohm	AA
R108	VRD-ST2EE560J	56 ohm	AA
R201	VRD-SU2EE271J	270 ohm	AA
R202	VRD-SU2EE561J	560 ohm	AA
R203	VRD-SU2EE561J	560 ohm	AA
R205	VRD-SU2EE103J	10K ohm	AA
R206	VRD-SU2EE223J	22K ohm	AA
R207	VRD-SU2EE103J	10K ohm	AA
R208	VRD-SU2EE223J	22K ohm	AA
R209	VRD-SU2EE103J	10K ohm	AA
R210	VRD-SU2EE223J	22K ohm	AA
R211	VRD-SU2EE103J	10K ohm	AA
R212	VRD-SU2EE223J	22K ohm	AA
R214	VRD-SU2EE103J	10K ohm	AA
R215	VRD-SU2EE103J	10K ohm	AA
R216	VRD-SU2EE223J	22K ohm	AA
R217	VRD-SU2EE103J	10K ohm	AA
R218	VRD-SU2EE223J	22K ohm	AA
R219	VRD-SU2EE563J	56K ohm	AA
R220	VRD-SU2EE103J	10K ohm	AA
R221	VRD-SU2EE102J	1K ohm	AA
R222	VRD-SU2EE103J	10K ohm	AA
R223	VRD-SU2EE563J	56K ohm	AA
R224	VRD-SU2EE563J	56K ohm	AA
R225	VRD-SU2EE563J	56K ohm	AA
R226	VRD-SU2EE222J	2.2K ohm	AA
R227	VRD-SU2EE103J	10K ohm	AA
R228	VRD-SU2EE223J	22K ohm	AA
R229	VRD-SU2EE681J	680 ohm	AA
R231	VRD-SU2EE222J	2.2K ohm	AA
R232	VRD-SU2EE222J	2.2K ohm	AA
R233	VRD-SU2EE681J	680 ohm	AA
R234	VRD-SU2EE681J	680 ohm	AA
R235	VRD-SU2EE221J	220 ohm	AA
R236	VRD-SU2EE471J	470 ohm	AA
R237	VRD-SU2EE103J	10K ohm	AA
R238	VRD-SU2EE103J	10K ohm	AA
R240	VRD-SU2EE103J	10K ohm	AA
R241	VRD-SU2EE103J	10K ohm	AA

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
R242	VRD-SU2EE473J	47K ohm	AA
R243	VRD-SU2EE103J	10K ohm	AA
R244	VRD-SU2EE103J	10K ohm	AA
R245	VRD-SU2EE471J	470 ohm	AA
R246	VRD-SU2EE103J	10K ohm	AA
R247	VRD-SU2EE103J	10K ohm	AA
R248	VRD-SU2EE151J	150 ohm	AA
R250	VRD-SU2EE103J	10K ohm	AA
R251	VRD-SU2EE103J	10K ohm	AA
R252	VRD-SU2EE102J	1K ohm	AA
R254	VRD-SU2EE473J	47K ohm	AA
R255	VRD-SU2EE121J	120 ohm	AA
R256	VRD-SU2EE103J	10K ohm	AA
R257	VRD-SU2EE103J	10K ohm	AA
R258	VRD-SU2EE103J	10K ohm	AA
R259	VRD-SU2EE222J	2.2K ohm	AA
R260	VRD-SU2EE332J	3.3K ohm	AA
R261	VRD-SU2EE563J	56K ohm	AA
R262	VRD-SU2EE563J	56K ohm	AA
R263	VRD-SU2EE332J	3.3K ohm	AA
R264	VRD-SU2EE473J	47K ohm	AA
R266	VRD-SU2EE101J	100 ohm	AA
R267	VRD-SU2EE225J	2.2 Meg ohm	AA
R268	VRD-SU2EE473J	47K ohm	AA
R269	VRD-SU2EE103J	10K ohm	AA
R271	VRD-SU2EE103J	10K ohm	AA
R272	VRD-SU2EE683J	68K ohm	AA
R273	VRD-SU2EE224J	220K ohm	AA
R274	VRD-SU2EE104J	100K ohm	AA
R275	VRD-SU2EE332J	3.3K ohm	AA
R276	VRD-SU2EE222J	2.2K ohm	AA
R277	VRD-SU2EE472J	4.7K ohm	AA
R278	VRD-SU2EE472J	4.7K ohm	AA
R279	VRD-SU2EE223J	22K ohm	AA
R280	VRD-ST2EE102J	10K ohm	AA
R281	VRD-ST2EE224J	220K ohm	AA
R301	VRD-SU2EY102J	1K ohm	AA
R302	VRD-SU2EY102J	1K ohm	AA
R303	VRD-SU2EE471J	470 ohm	AA
R305	VRD-SU2EY332J	3.3K ohm	AA
R306	VRD-SU2EY393J	39K ohm	AA
R307	VRD-SU2EY103J	10K ohm	AA
R308	VRD-SU2EY222J	2.2K ohm	AA
R311	VRD-SU2EY333J	33K ohm	AA
R312	VRS-PT3DB331J	330 ohm, 2W, ±5%, Oxide Film	AB
R313	VRD-SU2EY102J	1K ohm	AA
R315	VRD-SU2EY222J	2.2K ohm	AA
R316	VRD-SU2EY103J	10K ohm	AA
R317	VRD-SU2EY122J	1.2K ohm	AA
R401	VRD-ST2EE103J	10K ohm	AA
R402	VRD-ST2EE223J	22K ohm	AA
R403	VRD-ST2EE103J	10K ohm	AA
R404	VRD-ST2EE103J	10K ohm	AA
R405	VRD-ST2EE273J	27K ohm	AA

MISCELLANEOUS

1	91Z897689	Shield Plate	AD
2	——	P.W. Board, Transport Ass'y (With Output Leads) (Board only not available)	—
3	91Z897691	Sensor Holder	**
4	91Z898142	Sub Chassis	AL
5	91Z620049-1	Turntable	BF
6	91Z897907	Brake Arm	AD
7	91Z871956	Rubber Mat	AQ
8	91Z896598-2	Eccentric Pin	AC
9	91Z897672	Drum, Join Motor	AH
10	91Z851698-1	Dust Cover	BF
11	91Z897673	Metal Plate, Drum	AE
12	91Z897667	Spring, Tray	AC
13	91Z871972	Hinge	AN
14	91Z897664	Gear	AE
15	91Z897876	Spring, Gear	AC
16	91Z897668	Washer, Stainless Steel	AC
17	91Z851671	Control Panel (RP-7100H)	AX
	91Z851671-4	Control Panel (RP-7100HB)	**
18	91Z897666	Gear, Tonearm	AF
19	91Z897665	Gear, Tonearm	AD
21	91Z705259	Sub Motor	AW
22	91Z897813	Pulley, Motor	AH
24	QACCB0054AF09	AC Supply Cord (SUK)	**
	QACCV0001AGZZ	AC Supply Cord (SEEG)	AP
	QACCZ0053AF00	AC Supply Cord (EX)	AK
	QACCZ0002TA0F	AC Supply Cord (EX)	AF
	91Z897322	AC Supply Cord (SCA)	**
26	LBSHC0004AGZZ	Bushing, AC Supply Cord (SEEG)	AB
	LBSHC0003AFZZ	Bushing, AC Supply Cord (SCA·EX)	AA
	LBSHC0002AFZZ	Bushing, AC Supply Cord (SUK)	AB
27	91Z897682	Rubber, Solenoid	AB
29	91Z871958	Bracket, Motor	AG
30	91Z897894	Shaft, Motor	AD
31	91Z897677	Pulley, Motor	AD
32	91Z897692	Belt, Motor	AD
33	91Z892227	Leg	AE
34	91Z891215	Washer, Leg	AB
35	91Z890432-3	Cushion, Leg	AB
36	91ZE-825187	Spring, Leg	AE
37	91Z890755	Wire Holder	AD
38	91Z871965	Cam, Arm lifter	AF
39	91Z897669	Gear (Double Type)	AF
40	91Z897671	Lever, Micro-Switch	AD
41	91Z898284	Spring, Solenoid Operation Lever	AC
42	91Z872035	Main Chassis	AX
43	91Z897814	Shaft, Solenoid Operation	AD
44	91Z897663	Lever, Solenoid Operation	AG
45	——	P.W. Board, Auto Return (Board only not available)	—
46	91Z851670	Tonearm Assembly	BP
47	91Z897681	Shield Plate, Main P.W. Board	AC
48	——	P.W. Board, Logic (Board only not available)	—
50	91Z897744-1	Mirror, Stroboscope	AD
51	91Z847109	Bottom Plate	AV
52	91Z872039	Power Transformer	AZ
53	91Z893037-3	Bracket, AC Supply Cord (SEEG·SUK)	AD
	91Z892624-3	Bracket, AC Supply Cord (SCA·EX)	AD
54	——	Spacer, Power Transformer	—
55	91Z242020	Cushion, Power Transformer	**
56	91Z898146	Screw, Power Transformer	**
57	91Z897734	Cushion, Dust Cover	AC
58	91Z897683	Button (RP-7100H)	AG
	91Z897683-2	Button (RP-7100HB)	**

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
59	91Z897685	Bracket, Controls	AD
60	JKNBM0297AFSA	Knob, Power Switch (RP-7100H)	AD
	JKNBM0297AFSB	Knob, Power Switch (RP-7100HB)	**
61	91Z631758-6	DC Servo Mono-torque Motor (DD Motor) (With Control P.W. Board)	BK
62	——	P.W. Board, Power Ass'y (Board only not available)	—
63	91Z847110-1	Cabinet	BD
64	91Z897841	Spacer, Controls Bracket	AC
65	91Z892618-4	Knob, Pitch Controls (RP-7100H)	AL
	91Z892618-6	Knob, Pitch Controls (RP-7100HB)	**
66	91Z897684	Knob, Speed Selector/Quarts-crystal PLL (RP-7100H)	AG
	91Z897684-2	Knob, Speed Selector/Quarts-crystal PLL (RP-7100HB)	**
67	——	P.W. Board, Switch Ass'y (Board only not available)	—
68	——	P.W. Board, Stroboscope Ass'y (Board only not available)	—
69	91Z898165	Reflect Plate	AD
70	91Z898145	Frosted Plate	AD
71	91ZE-825182	Spring, Leg	AC
72	91Z897688-1	Transparent Plate	AD
73	91Z700749	Spacer, Sub Motor	AC
74	91ZE-288760	Cushion, Sub Motor	AC
75	PSPAS0080AFSA	Spacer, Power Switch (RP-7100H)	AB
	PSPAS0080AFSB	Spacer, Power Switch (RP-7100HB)	**
76	91Z897675	Stopper, Motor Shaft	**
77	91Z897736	Spacer, Button (RP-7100H)	**
	91Z897736-2	Spacer, Button (RP-7100HB)	**
78	91Z897735	Cover, LED	**
79	91Z897686	Transparent Plate, Stroboscope	**
F1	With in Control P.W.B. Ass'y	Fuse, T 800mA	—
F2	With in Control P.W.B. Ass'y	Fuse, T 800mA	—
F101	With in Power P.W.B. Ass'y	Fuse, T 200mA	—
F102	With in Power P.W.B. Ass'y	Fuse, T 200mA	—
SW1, SW2, SW3, SW4, SW5, SW6, SW7, SW8, SW9, SW10 SW11	QSW-Z0051AFZZ	Switch, Play/Repeat Play/ Cueing Control/Cut Out/ APLD Number	AD
SW12	91Z872069	Switch, Power	AR
SW13	91Z894614	Switch, Tonearmrest Up	AK
SW14	91Z894614	Switch, Tonearmrest Down	AK
SW15	91Z871418	Switch, Rest	AH
SW16 (A, B)	91Z872001	Switch, Speed Selector/Quarts-crystal PLL ON-OFF	AQ
	91Z897904	Tonearm Lifter	AG
	91ZH-SHELL5100	Head Shell	AZ
	91ZMWEIGHT5100	Counter Weight	AX
CNS201	91Z897911	Socket, 9 pin	**
CNS202	91Z897908	Socket, 4 pin	**
CNS203	91Z897913	Socket, 2 pin	**
CNS204	91Z897908	Socket, 4 pin	**
CNS205	91Z897912	Socket, 9 pin	**
CNS206	91Z897915	Socket, 9 pin	**
CNS207	91Z897914	Socket, 3 pin	**
CNS208	91Z895382	Socket, 6 pin	**
CNS301	91Z897918	Socket, 9 pin	**
CNS401	91Z898316	Socket, 6 pin	**
CNP201	With in Logic P.W. B.Ass'y	Plug, 9 pin	—
CNP202	With in Logic P.W. B.Ass'y	Plug, 4 pin	—
CNP203	With in Logic P.W. B.Ass'y	Plug, 2 pin	—
CNP204	With in Logic P.W. B.Ass'y	Plug, 4 pin	—
CNP205	With in Logic P.W. B.Ass'y	Plug, 9 pin	—
CNP206	With in Logic P.W. B.Ass'y	Plug, 9 pin	—
CNP207	With in Logic P.W. B.Ass'y	Plug, 3 pin	—
CNP208	With in Logic P.W. B.Ass'y	Plug, 5 pin	—
CNP401	With in Logic P.W. B.Ass'y	Plug, 6 pin	—
CNP301	91Z399253-7	Plug, 9 pin	**
TP1	91Z399253-1	Test Point, 4 pin	**
SO1	QSOCE0551AFZZ	Switch, Voltage Selector	AG
SO101, SO102	91Z894205-1	Output Leads	**
SOL201	91Z897896	Solenoid	AN
	91Z897904	Tonearm Rest	AG

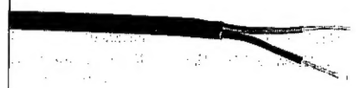
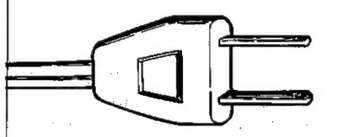
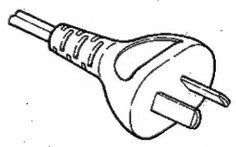
AC supply cord	Bushing	Connection		Photograph of figure
		Ⓛ	Ⓝ	
QACCB0054AF09	LBSHC0002AGZZ	Brown	Blue	
QACCV0001AGZZ	LBSHC0004AGZZ	Brown	Blue	
QACCZ0053AF00	LBSHC0003AGZZ	Black	Black	
QACCZ0002TA0F	LBSHC0003AGZZ	Brown	Brown	
91Z897322	LBSHC0003AGZZ	Black	Black	

Figure 54 AC SUPPLY CORD WIRING CONNECTION

A7907-3.85MNK
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